Asthma Management Practices In Two Ontario School Districts: Applying Knowledge To Action

By

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A thesis submitted to the School of Nursing
In conformity with the requirements for
the Degree of Master of Science

Queen's University
Kingston, Ontario, Canada
November 2013

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Abstract

Background: School settings are one of the most crucial context for asthma management second only to a child’s home. Today school administrators are faced with many challenges, not only are they responsible for students' learning needs but they also manage complex behavioural and health issues including asthma. Most do not have standardized plans regarding asthma management.

Objectives: 1) Systematically review the research literature related to asthma management within the school setting. 2) Determine current asthma management practices as reported by school administrators. 3) Explore experiences and barriers to asthma management practices with school administrators.

Method: Guided by the Knowledge to Action framework, the study was divided in three phases using a planned action approach and included an integrative synthesis of the evidence, an administrators’ survey, and an administrator’s meeting.

Findings:

Phase One: Following a search using three databases, 67 articles were critiqued. The literature illustrates that many countries have established “asthma friendly schools” legislation that includes process for identifying children with asthma, right to self-carry and administer medications, enhancing communication and cooperation between school staff, parents, and children with asthma, reducing triggers in school environment, and effective policies that make legislation a functioning reality within schools.

Phase Two: Ninety-seven surveys were distributed within two district school boards with 61 completed surveys returned (63% response rate). Key findings included underestimation of the prevalence of asthma, no standardized process for identifying
children with asthma, staff training deficiency for recognizing and responding to asthma exacerbations, lack of individual asthma action plans for children, absence of programs to support current legislation and best practice guidelines. Communication was the most common barrier identified by school administrators.

**Phase Three**: Two principals in an administrator’s meeting validated the survey results. Participants were not familiar with the concept of asthma friendly school, asthma prevalence rates, or free school asthma resources. Asthma Action Plans were not universally understood as individualized written plans but rather a generalized first aide response plan.

**Conclusion**: There are knowledge and practices gaps placing children with asthma at risk for exacerbation and death within school setting. Administrators want to partner to facilitate optimal asthma management within the school setting.
Acknowledgements

I would not have had this opportunity without the support, encouragement, and expertise of several individuals and organizations.

Thank-you to my thesis committee especially my faculty supervisor, Dr. Kim Sears, not only for her research expertise but whose calm and cheerful demeanor was always welcomed and reassuring. To Dr. Joan Almost and Dr. Marg Harrison for their thoughtful revisions and encouragement throughout the study. I would also like to extend my appreciation to Dr. Deborah Tregunno as internal examiner and Dr. Denise Stockley as the external reviewer. I am also grateful to Dr. Diane Buchanan, delegate director of the School of Nursing and Dr. Linda Levesque who served as chair for the oral examination.

I would like to acknowledge the Ontario Lung Association for their tireless efforts to improve lung health throughout the province and the Ontario Respiratory Care Society for awarding me a Fellowship. In addition, financial support was provided from Queen’s University, the Ontario Ministry of Training, Colleges, and Universities, Health Science Centre School of Nursing Alumni, and the Registered Nurses Association of Ontario’s Pediatric Nurses Interest Group.

On a more personal note, a big thank-you to my husband Wes, a brilliant writer and my partner of 22 years. For all the countless hours editing my undergraduate papers, building my skill and confidence, I would like to thank-you. For picking up the slack around the house, keeping the kids busy, and being a voice of reason, thank-you. To my children Kate and Seth whom I love with a tender fierceness. Kate, I can finally play, no more thesis writing!
To my mom whose encouragement and support of me was limitless just like her passion for red wine, dark chocolate, and excellent conversation. To my family and in-laws for support and encouragement. Dad, for telling me how proud you were of me.

To Janice Minard, a professional mentor and good friend. Janice has an amazing sense of vision and I return to her often for much valued advice.

To Sarah Wickett and Roxanne Hart, Library Scientists for their guidance and skill at finding needles in haystacks.

To Alicia and Jane my fellow Master’s students for their support and encouragement over the past two years. To my friend and colleague Jennifer Olajos-Clow who refused to let me quit!

Finally, everyone has a story; I just happen to be on the receiving end of this particular one. I would like to thank all the families and children who shared their experiences with me. I hope that through this thesis project, their stories will have a happy ending.
Declaration of Interest

Nicola Thomas is a Master of Science student at Queen’s University, Faculty of Health Science within the School of Nursing. Her clinical knowledge and practice is specialized to paediatric asthma education. As a registered nurse and nationally certified asthma educator, she practices according to the standards set out by the College of Nurses of Ontario and Canadian Paediatric Asthma Consensus Guidelines to promote optimal disease management regardless of setting.

In terms of the topic of paediatric asthma management within the school setting, Nicola does not have any commercial or financial conflict of interest. On a personal note, she is the mother of two children, one of which has been diagnosed with asthma. The research topic was guided by families’ stories from her clinical practice not from personal experience. The purpose of the research was to systematically review the research literature related to asthma management within the school setting; determine current asthma management practices within the school setting as reported by school administrators, and explore experiences and barriers to asthma management practices with school administrators.
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<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AA</td>
<td>Administrative Assistant</td>
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<td>AAP</td>
<td>Asthma Action Plans</td>
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<td>APA</td>
<td>Asthma Plan of Action</td>
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<td>BCS</td>
<td>Building Conditions Survey</td>
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<td>CAE</td>
<td>Certified Asthma Educator</td>
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<td>CASP</td>
<td>Critical Appraisal Skill Programme</td>
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<td>CDC</td>
<td>Centre of Disease Control and Prevention</td>
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<td>CINAHL</td>
<td>Cumulative Index to Nursing and Allied Health Literature</td>
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<td>CMO</td>
<td>Chief Medical Officer</td>
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<td>DVD</td>
<td>Digital Versatile Disc</td>
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<td>ERIC</td>
<td>Education Resources Information Center</td>
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<td>GINA</td>
<td>Global Initiatives for Asthma</td>
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<td>ICAS</td>
<td>Inner City Asthma Study</td>
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<tr>
<td>ICD-9</td>
<td>International Classification of Diseases, 9th Enhancement Code Revisions</td>
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<tr>
<td>ICES</td>
<td>Institute of Clinical Evaluative Sciences</td>
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<td>KTA</td>
<td>Knowledge to Action</td>
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<tr>
<td>MOHLTC</td>
<td>Ministry of Health and Long Term Care</td>
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<td>NHLBI</td>
<td>National Heart Lung and Blood Institute</td>
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<td>OEL</td>
<td>Ontario Education Law</td>
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<td>OLA</td>
<td>Ontario Lung Association</td>
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<tr>
<td>Opheal</td>
<td>Ontario Physical Health and Education Association</td>
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<td>PD</td>
<td>Professional Development</td>
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<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>PHSAPP</td>
<td>Public Health School Asthma Pilot Project</td>
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<td>RAP</td>
<td>Roaring Adventures of Puff</td>
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<td>SBHC</td>
<td>School Based Health Clinics</td>
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<td>SHPPQ</td>
<td>School Health Profile Principals Questionnaire</td>
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<tr>
<td>SICAS</td>
<td>School Inner City Asthma Study</td>
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<tr>
<td>SPRCS</td>
<td>Statewide Planning and Research Cooperative Systems</td>
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<tr>
<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
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<tr>
<td>UK</td>
<td>United Kingdom</td>
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<td>US</td>
<td>United States</td>
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<td>WAD</td>
<td>World Asthma Day</td>
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<td>WHO</td>
<td>World Health Organization</td>
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Chapter 1

Introduction

The school setting is one of the most crucial context for asthma management second only to a child’s home. Today school administrators are faced with many challenges, not only are they responsible for students’ learning needs but they also manage complex behavioural and health issues including asthma (McGhan, Reutter, Hessel, Melvin, & Wilson, 2002). Over the past two decades the prevalence of asthma has risen markedly in Canada and around the world (Garner & Kohen, 2008; Gershon, Guan, Wang, & To, 2010; Lougheed et al., 2012; World Health Organization, 2007). This increase is particularly evident among school age children, with approximately 21 % of Ontario’s paediatric population being diagnosed with asthma in 2009 (Ontario Asthma Surveillance Information System, 2012) compared to 12 % in 2001 (To et al., 2004) and 2.5 % reported in 1982 (D’Cunha, 2000).

The Issue

Although there is no cure, asthma is a disease that can be controlled allowing individuals to experience few symptoms (Lougheed et al., 2012). However, a lack of knowledge and suboptimal management practices can put a child with asthma at risk for sudden exacerbation, hospitalization, and even death (Putman-Casdorph in reference list & Badzek, 2011). Because asthma is so common, and children spend on average 30 % of their day in school (Gretch & Neuharth-Pritchett, 2007), the school setting is one of the most critical contexts for asthma prevention, education, and management (Snow, Larkin, Kimball, Iheagwara, & Ozuah, 2005). Despite the challenges they face, schools are in the unique position to improve the education and health status given they are the only
institution that can reach almost all children and youth (Fisher et al., 2005). While legislation was designed to ensure a safe environment and optimal disease management within the school setting, school boards have a responsibility to create policies that support and align with existing law (Cicutto et al., 2012). Many schools do not have standardized policies regarding asthma management (McGhan et al., 2002).

Based on a coroner’s inquest and Chief Medical Officer’s (CMO) report following the 1999 death of an adolescent with asthma, the Ontario's Ministry of Health and Long-Term Care established a provincial asthma strategy resulted in an evidence guideline-based plan called the Asthma Plan of Action (APA) (Garvey & Lougheed, 2004). The APA identified thirteen initiatives including addressing asthma management within the school setting and the need for schools to be “asthma friendly” (Garvey & Lougheed, 2004). Components of an asthma friendly school included a process to identify students with asthma, easy access to reliever medication, staff training for recognizing and responding to asthma attacks, identifying and reducing environmental triggers, encouraging students to join in all activities, providing staff, students, parents the opportunity to learn more about asthma, and partnership between public health units and schools (Cicutto et al., 2006).

The APA school initiative was the three year Public Health School Asthma Pilot Project (PHSAPP) (Cicutto et al., 2006). The pilot's goals were to create asthma friendly and supportive school environments with reducing school absenteeism, days of interrupted activity, and health care utilization (Cicutto et al., 2006). Evaluation resulted in less school days missed due to asthma, less days of interrupted physical activity due to asthma, fewer urgent health care visits due to asthma, and improvement in quality of life
for children with asthma. There were also significant improvements at the school level that included improving the asthma friendliness and supportiveness of school environments, which in turn created a safe place for students with asthma, as well as an environment that facilitated successful self-management, personal growth and integration into school life (Cicutto et al. 2006).

In 2007, based on these results the PHSAPP received funding to continue as a permanent program in four of the five original sites (personal communication, March 15, 2012). Recognizing the tremendous benefits of this program and fiscal limitations the Ministry of Health and Long Term Care created "Train the Trainer program" in order to assist in disseminating the program across the province. The Ontario Education Law further assisted in facilitating asthma school initiatives were strengthened by the that outlined the responsibility of school administrator, staff, parent and child in terms of communication of diagnosis, review of treatment, medication administration, and storage (Brown & Zucker, 2007).

The urgency of addressing asthma management within the school setting was brought to the forefront again in October 2012 after Ryan Gibbons, a 12-year-old boy died at school from his asthma. No previous study has investigated asthma management at the two public district school boards for this Ontario region. In fact, there were no specific asthma school policies provided by either board. One of the boards reported it is the individual principal who decides how asthma will be managed within the school (personal communication, January 19, 2012). This statement was consistent with existing research that development and implementation of school policies for asthma management falls solely to the administrator (Hone-Warren, 2007). The study was conducted to
explore and assess management practices at the local school level. In order to achieve this, a mixed method multi phased study was undertaken.

**Context and Background**

At the Regional General Hospital’s Asthma Education Centre (AEC), the area of the district school boards within this study, children and their families are referred by their primary care provider for enrolment in the Family Asthma Program®, an evaluated education program. Working together with children and families facilitating effective disease management is an important aspect of the program. Families attend on average three 1-1.5 hour appointments that cover a variety of topics including disease physiology, early warning signs of worsening asthma, appropriate treatment (medication use), device technique, asthma action plan, trigger avoidance, environmental control measures, and self-management. The emphasis is on partnership and collaboration with all those adults involved in a child’s care including childcare providers, school staff, primary care providers, medical specialists, as well as parents or other legal guardians. Ultimate goal is a child’s safety and optimal disease management regardless of setting. The biggest worry voiced by parents enrolled in the program is the issue of asthma management within the school context. This issue prompted the researcher’s interest in this topic and became the basis for this study. The terms administrator and principal are used interchangeably throughout this thesis.

**Conceptual Framework**

Despite the considerable resources that are allocated to health science research, a consistent finding from the literature is that the translation of research findings into practice is often a slow and haphazard process and as a result, individuals are not
receiving the best care (Graham et al., 2006). The Knowledge to Action [KTA] framework (Figure 1) represents all the components from knowledge creation to the implementation of knowledge, provides a comprehensive approach to knowledge translation (Sudsawad, 2007), and will be used for this study project.

The framework is comprised of two distinct processes namely knowledge creation and knowledge action (Graham et al., 2006). It is important to note that these are a dynamic and iterative process that includes synthesis, dissemination, exchange, and ethically sound application of knowledge (Canadian Information of Health Research, 2004). The framework includes multidirectional interactive communication, on-going collaboration, multiple activities, nonlinear process, and the emphasis on use of ethically sound research-generated knowledge (Reimer-Kirkham et al, 2009; Sudsawad, 2007).

In order to effectively implement the KTA framework, involvement, support, and building study momentum with key players (district school boards, administrators, & researcher) were crucial to the study’s success and ensured empirical support for research-practice partnership (Harrison & Graham, 2012). All three-study phases were grounded in the KTA framework (Figure 1), as a phased action approach. In phase one of the study a comprehensive literature review focused on Knowledge Inquiry and Knowledge Synthesis by examining the issue, extent of the problem, and evidence for asthma management within the school context. In the second phase, administrative survey focused on Adapting Knowledge (Current Legislation) to Local Context (English schools) and Assess Barriers to Knowledge Use (appropriate asthma management). The administrators’ meeting and third phase provided a forum for group discussion to further assist in understanding administrator attitudes and experiences and guide the decision
related process to asthma management in the school setting. This phase continued to Assess Barriers to Knowledge Use (survey results, administrators’ experiences/attitudes regarding asthma management) and Select, Tailor, Implement Interventions (set goals for asthma management within the school setting and discussed strategic vision and plan, development of policy), and Monitor Knowledge Use and Evaluation Outcomes (discuss outcome measures and evaluation plan).

**Purpose and Objectives of the Thesis Research**

The purpose of this mixed method thesis study was to review available research, assess current practices, barriers and facilitators reported by administrators, evaluate how these align with best evidence and legislation on asthma management, and make practice and policy recommendations. Objectives for each study phase are reviewed below.

**Phase One: Integrative Synthesis of Available Research.** Looking to the literature, the objectives of the study’s first phase was to: 1) synthesize the evidence regarding asthma management practices in schools; 2) identify best practices at a provincial, national, and international level, and 3) determine if these practices being implemented and how are they supported by policy and legislation.

**Phase Two: Is There a Practice Gap?** Phase Two of the study undertook a survey of school administrators (Chapter 3). The objectives of this study phase were to: 1) determine reported practices by school administrators for managing children's asthma within public schools within two public district school boards; 2) examine how these align with best practices and current legislation namely the Ontario Education Law, and 3) identify barriers for asthma management within context of the school setting.

**Phase Three: What is the Key Stakeholders’ Response?** Self-identified
administrators participated in a meeting (Chapter 4). Main objectives were to: 1) review and discuss survey results; 2) identify important facilitating factors and barriers; 3) provide empirical support for planning, and 4) build momentum and enthusiasm among administrators by emphasizing the direct benefits of optimal management (decrease absenteeism & increased academic performance with minimal disruption to class time).

**Thesis Organization**

Each of the chapters listed below includes a description of methods used, summary of results, along with discussion and implications for practice and policy. In chapter five, the results of the thesis study are discussed along with implications to facilitate optimal asthma management within the school setting. This manuscript style thesis is arranged as follows:

Chapter 1: Introduction and Background

Chapter 2: An Integrative Comprehensive Synthesis of the Evidence Regarding Asthma Management Practices in Schools (Manuscript 1 to be submitted following thesis defense. Journal to be determined)

Chapter 3: Is There a Practice Gap? (Manuscript 2 to be submitted to Journal of School Health following thesis defense)

Chapter 4: What is the Key Stakeholders’ Response?

Chapter 5: Summary
References


Figure 1. Knowledge to Action Framework.

Figure 1. Taken from “Lost in Knowledge Translation: Time for a Map?” by Graham, Logan, Harrison et al., 2006, *Journal of Continuing Education in the Health Professions*, 26, p. 19.
Chapter Two

An Integrative Comprehensive Synthesis of the Evidence Regarding Asthma Management Practices in Schools
Abstract

Purpose: To undertake an integrative comprehensive synthesis of the evidence regarding asthma management practices in schools.

Methods: Review was conducted using CINAHL, Medline, and ERIC databases. As the first Canadian Asthma Consensus Guidelines were established in 1999, dates for search were limited 1999-2013, English publications only. Earlier articles were included if they were seminal works. All articles were evaluated using the Critical Appraisal Skill Programme (CASP). Searches were completed exploring parental concern and for each of the components of an asthma friendly school including medication storage and administration, role of the school, and asthma school policies.

Results: A total of 1075 articles were retrieved once duplicates were removed. After critique, 67 articles were kept for the literature review. To provide a further break down: six articles were included that addressed the concept of parental concern, medication storage and administration (23 articles), role of the school including physical environment and health education (8 & 17 studies respectively), policy and liability (13 articles).

Findings: Qualitative studies found families worry about their child with asthma once enrolled in the school system. Access to rescue inhalers is restricted and there is lack of training by school staff to recognize and respond appropriately to worsening asthma. Allergens are present in the school setting however amounts vary depending on the season, geographical location, and type classroom. There is little study examining relationship between school based trigger exposure and morbidity and mortality. School-based education is effective in reducing number of night awakenings, and exercise
symptoms. There were mixed results in terms of hospitalization utilization. No studies examined whether outcomes were maintained after 12-month period.

Conclusions: Managing asthma within the school setting is a provincial, national, and international issue. International organizations have recognized the challenges schools face when trying to establish a safe and supportive environment and in response many countries have established asthma friendly school policies. Support, collaboration, and partnership are necessary in order for schools to be health-promoting institutions.
Schools are faced with many challenges, not only are they responsible for student’s learning needs but they also manage complex behavioural and health issues including asthma (McGhan et al., 2002). Despite the challenges they face, schools are in the unique position to improve the education and health status given they are the only institution that can reach almost all children and youth (Fisher et al., 2005). Because asthma is so common, and given that children spend on average 30% of their day in school (Gretch & Neuharth-Pritchett, 2007), the safe management of asthma within this setting is an important aspect for this study, especially as lack of knowledge and suboptimal management practices can put a child with asthma at risk for sudden exacerbation, hospitalization, and even death (Putman-Casdorf & Badzek, 2011).

Research Questions

The primary research question of the integrated synthesis was, “Are asthma management school practices reported by parents attending the Regional General Hospital’s Asthma Education Centre echoed as a Universal issue? Secondary questions included, “What, if any, are the best evidence practices identified at an International, National, and local level? Are these asthma management practices being implemented and are they supported by policy and legislation?”

Search Strategy and Retrieval Method

A stepwise method was employed to seek and appraise the literature on asthma management practices within the school setting. The review was conducted using the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline, and Education Resources Information Center (ERIC). CINAHL was selected given its nursing and allied health focus while Medline enabled the writer to include other
resources not specific to nursing practice. In addition, ERIC (Education Resources Information Center) database was used given its citations related to teaching and research in education including journal articles, books, research syntheses, conference papers, technical reports, policy papers and other education-related materials. Hand search of bibliographies, Google scholar and grey literature were reviewed. Hand searched articles prior to 1999 were included in the review provided they were germinal studies. Germinal studies were determined by frequently cited within literature or were initial studies that were the catalyst of additional research.

The first Canadian Asthma Consensus Guidelines were released in 1999 and therefore time frame limits were comprised between 1999-2013 and included English only publications. Whenever possible, children ages six years and older were included in this literature search because a more accurate asthma diagnosis is possible in the age group as they are able to complete lung function testing, a key objective measure required for diagnosis. Parental concern was the first concept searched; key words included asthma, parents, experiences, and qualitative studies. Medication storage and administration was next with medication, bronchodilator agents, anti-asthmatic agents, drug storage, drug therapy, asthma, schools as key words. Role of the school was broken down into safe and supportive environment and in-house education. Key words searched included environment, physical environment, health education, patient education, schools, school health, school health services, school nursing, students, and asthma. The final component searched was the need for asthma school policies. Key words included: medication, drug therapy, policy, school policies, liability, liabilities, liable, legal, asthma, and schools.
Critical Review

Abstracts of articles were assessed; the ones on topic were pulled and then critically appraised. Articles that were not applicable to the study’s research questions were excluded. All articles were evaluated using the Critical Appraisal Skill Programme (CASP). Established in the early 1990’s, this United Kingdom (UK) program was developed by research experts, piloted, and evaluated by the Oxford Regional Health Authority (Critical Appraisal Skill Programme, 2010). According to CASP, it is a sound method that was developed to assist individuals’ critical appraisal of scientific research. Each article was evaluated and scrutinized to see whether methodology was valid and free of bias. Next, results were examined to see if they are statistically significant in the form of p values, confidence intervals and sensitivity analysis (Critical Appraisal Skill Programme, 2010).

Results

As parental concern was the catalyst for the study, this will be the first concept presented followed by the components of an “asthma friendly school” namely: 1) medication storage and administration; 2) the role of the school; and 3) asthma school policies. In total, 1079 articles (after duplicates removed) were found. Following appraisal, 67 were kept in the total review. To provide a further break down: six articles were included that addressed the concept of parental concern, medication storage and administration (23 articles), role of the school including physical environment and health education (8 & 17 studies respectively), policy and liability (13 articles).

Parental Concern

Review. A total of 76 articles were retrieved during the literature search all were
reviewed by title. Based on this, twelve abstracts were reviewed and six studies were kept after appraisal; four were American, one was Canadian, and one was Swedish. Discarded studies included parental perceptions of asthma medication and behaviour, three articles on culture and asthma, financial strain, and relationship between health care provider and parents.

The theme of protecting and “retaining one’s hold” was discovered in Swedish hermeneutic phenomenology study involving twelve mothers and fathers. Relinquishing control to school staff for management of their child's asthma was a stressful experience and source of concern for parents (Dalheim Englund, Rydstrom & Newacheck, 2001).

The basis of concern was that children with asthma have different needs. Asthma causes respiratory changes in response to various triggers including exercise, irritants, and allergens. Exposure to these triggers can result in mild to life threatening symptoms (Dalheim Englund, Rydstrom, & Norberg, 2001; Putnam-Casdorf & Badzek, 2011; Sciurba, 2004). Environmental trigger exposure identified by parents included: poor air quality, school cleaning, maintenance, class pets, renovation, arts and crafts, carpets, school physical education, pollen, or cold air. When trying to promote an asthma friendly environment, parents reported school staff lacked understanding and sensitivity (Cashin, Small, & Solberg, 2008; Dalheim Englund, Rydstrom & Norberg, 2001). Eight fathers in a St. Johns Newfoundland hermeneutic phenomenological study reported resistance when advocating for a change in asthma medication school policy. As a result, fathers of asthmatic children instructed their children to bypass school procedures and 'keep the puffer with them in their backpack' (Cashin, Small, & Solberg, 2008).

In the six qualitative studies reviewed, parents worried about their child with
asthma for three main reasons: 1) perceived lack of standards for medication administration in schools (Barrett, Gallien, Dunkin, & Ryan, 2001; Buford, 2004; Horner, 1997; Meng & McConnell, 2002) 2) exposure to numerous triggers in the school environment (Barrett, Gallien, Dunkin, & Ryan, 2001; Cashin, Small, & Solberg, 2008; Dalheim Englund, Rydstrom, & Norberg, 2001; Horner, 1997), and 3) suboptimal collaboration with school staff when parents attempted to address environmental or medication access concerns (Barrett, Gallien, Dunkin, & Ryan, 2001; Buford, 2004; Cashin, Small, & Solberg, 2008; Dalheim Englund, Ryderstrom, & Norberg, 2001; Horner, 1997; Meng & McConnell, 2002).

In summary. The literature reveals several pertinent points about the parents’ experiences with asthma management within the school environment. While children are dependent on their parents or guardians, other adult caregivers and caregiving organizations play a vital role in assuring that a child is safe. Once enrolled in the public school system, “children are under the care of school personnel and are subject to rules and regulations, often beyond their control” (McGhan et al., 2002, p.113). Schools not only have an important role in continuity of care for the child with asthma (Halfon & Newacheck, 2000) but also have a responsibility to provide a safe and supportive environment (Clark, Clasen, Stolfi, & Jaballas, 2002; Crickmore Farrior, Keehner Engelke, Shoup Collins, Gordon Cox, 2000; St. Leger, 1999).

Medication Storage and Administration

A total of 251 articles were retrieved after duplicates were removed, 241 remained. Fifty articles were kept after abstracts were read. Based on this, 24 articles were pulled for review and 14 kept with an additional nine added from hand searched
bibliographies. Of these, 14 studies were American, six were from the UK, two Canadian and one was from Sweden.

**Review.** A cross-sectional study reviewing asthma management policies in 95 UK primary through high schools found that 75.8% of children were not allowed to self administer their medication, 45.4% of children were not permitted to take their puffer to physical education class, almost one third of schools required puffers to be locked in the school office, and only eight percent had documented asthma school policies (McCann et al., 2002).

A smaller study echoed similar results in terms of asthma management policies and protocols within five public elementary schools in New York. The study found that 34% required students to hand in their medication to the office upon arrival at school, 30% of staff was not familiar with their school's medication policies, and 20% of school staff did not know who was responsible for the child with asthma (Snow et al., 2005). In addition to staffs' lack of awareness, Cicutto et al. (2006) surveyed 3146 Ontario teachers from Durham, Peel, Sudbury, Halton, and Hamilton area. Respondents (n=1756, 56% response rate) identified other reasons for medication policies included teachers' lack of confidence to manage asthma; school letters that forbid medication administration in schools; school staffs' misperceptions that medication will cause harmful side effects; liability concerns; and belief by school staff that asthma is the parents' responsibility (Cicutto et al., 2006). “Perhaps of even more concern, school health procedures vary widely because governance, and thus policies, regulations, and budgets, are often left to the individual school district” (Johnson & Hayes, 2006, p.1277). Cicutto et al. (2012) completed a study examining anaphylaxis management practices within the school setting
for province with legislation (Ontario) and those without (New Foundland, Labrador, Quebec, British Columbia, & Alberta). One hundred and fifty school boards were randomly selected for assessment of anaphylaxis policies within the five provinces. The study also surveyed parents (n=1365, 33% response rate) and school staff including teachers, principals, vice principals, and administrative assistants (n=1563, 70% response rate). The anaphylaxis study identified that even in provinces with existing legislation in “place to protect children, there are in deficiencies in training of school staff, communication between parent and staff, and ineffective policy implementation for schools” (Cicutto et al., 2012, p. 136). This study can help highlight the deficiencies that may contribute to morbidity and mortality for students with asthma.

These deficiencies may contribute to fatal asthma episodes within the school. A retrospective US study found that of 38 asthma school deaths, delays in accessing reliever medication accounted for 31 % mortality rate. Reasons for these delays cited by staff included being unaware the student had asthma and medication available (17%), not trained in how to respond to asthma emergency situations (33%), children’s requests for help were ignored (33%), and school was considered ‘drug free’ therefore medications were not allowed in the school (17%) (Greiling, Boss, & Wheeler, 2005).

In summary. The literature reveals that asthma medication administration and storage is a common barrier for optimal asthma management within the school environment. Parental concerns regarding medication administration, accessibility, and storage were echoed as a universal issue throughout the quantitative literature (Cicutto et al., 2006; Everett Jones & Wheeler, 2004; Farris et al., 2004; Ficca & Welk, 2006; Fillmore, Jones, & Blankson, 1997; Hillemeier, Gusic, & Bai, 2006; Hootman & Will,
The most common practices reported by parents and staff were that asthma medications are either being locked up in the school office or kept with the homeroom teacher (Canham et al., 2007; Cashing, Small, & Solberg, 2008; Clay, Farris, McCarthy, Kelly, & Howarth, 2008; Dalheim Englund, Ryderstrom, & Norberg, 2001; Everett Jones & Wheeler, 2004; Fillmore, Jones, & Blankson, 1997; Guglielmo & Little, 2006; Horner, 1997; McCann et al., 2002; National Association of State Boards of Education, 2006; Newbould, Francis, & Smith, 2007).

While retrospective and cross sectional studies are subject to source bias, they highlight the need for greater awareness and responsiveness regarding asthma and its management within the school. In addition, strategies are required to improve medication access and administration within schools through education of teachers and school axillary staff (Chakraborty & Hammer, 2005; Cicutto et al., 2006; Fillmore, Jones & Blankson, 1997; Langenfeld, Bonaiuto, & Edmonds, 2006; Newbould, Francis, & Smith, 2007; Snow et al., 2005; Wong, Awolowo, Gordon, & Mo, 2004). Outlining a process for disseminating and evaluating uptake of medication policies should be identified (Putman-Casdorf & Badzek, 2011; Snow et al., 2005). Schools need to define a clear and effective process that will ensure children with asthma are provided with a safe and supportive environment. In addition, integrating comprehensive and appropriate health education within the school setting is required. This will allow schools to achieve their learning and health goals (Crickmore Farrior, Keehner Engelke, Shoup Collins, &
Gordon Cox, 2000).

**The Role of the School**

The physical school environment is extremely important for promoting and maintaining students' health especially those children with asthma (Centre for Disease Control and Prevention, 2012; National Asthma Education and Prevention Program, 2007). Compared to allergen research within home setting, environmental studies in schools have been less comprehensive (Abrahmson et al., 2006). Given that children spend approximately 30% of their day in the school setting (Gretch & Neuharth-Pritchett, 2007) it is important to examine this issue.

**Safe and supportive environment.** There has been an increase in study regarding the physical school environment since the 1980s with over 500 articles retrieved from the literature search. Articles were discarded if they were restricted to the outdoor contaminates (particulate matter) and geographical location of the school (close to the highway) as the researcher wanted to identify issues that could be addressed within the school setting. Of the 500 titles, 92 articles including one qualitative study were considered (six duplicates removed), 50 abstracts were then reviewed and 22 articles retrieved. After appraisal, seven US studies were kept.

**Review.** Of the reviewed studies four checked allergens in the school environment only, one examined association between the condition of the school building and health care utilization, the remaining observational studies collected home and school allergen samples in an attempt to understand exposure risk factors specific to the school. All of the studies identified poor air quality, school cleaning, maintenance, renovation, and environmental allergens as issues (Abrahams et al, 2006; Amr et al., 2002; Belanger,
Kielb, & Lin, 2006; Gruchalla et al., 2005; Permaul et al., 2012; Phipatanakul et al, 2011, Tortolero et al., 2002).

**Allergen in school setting.** Tortolero et al., 2002, conducted an observational study of 60 Texas elementary schools, completing environmental observation checklist (EOC). Measures of air exchange and ventilation assessing temperature, relative humidity, and carbon dioxide levels with a Q-TRAK monitor were completed for thirty minutes in each classroom during class time with students present. If abnormally high readings were obtained, the procedure was repeated to ensure accuracy. Research associates who conducted the study received extensive training and samples were collected through a standardized protocol (type of vacuum, dust collection devices, storage of mould samples etc). The study found dust mite were present in all classes with higher than recommended levels present in 20 % of all classrooms. All rooms had cockroach allergen however, 10 % had over the recommended threshold. Unacceptable levels of mould were discovered in more than half the classrooms. Poor air quality was an important finding with 86 % of sampled rooms having high levels of carbon dioxide (CO2) indicating the presence of toxic pollutants. Few schools had air exchangers while most did have inadequate ventilation (HVAC systems non functioning +/- containing rust & mould), and higher than recommended humidity, and irritants (cleaning products, paint fumes).

Although this study cannot be generalized to all school settings, Amr et al., 2002 found similar results in their smaller sample Baltimore city study. Of 12 schools surveyed, allergen was detected in all dust specimens collected with 66 % positive for cockroach and dust mite present in 48 %. Highest levels of allergen were collected in
teacher’s lounge, cafeteria, and lower grade classrooms. Dust mite allergens were similar if not lower in other studies; with 52% of classrooms having undetectable or small levels. This may have been related to the wintertime sample collection when humidity levels are lower. Cockroach and mouse levels were highest in areas where food was present. Higher than sensitization levels (>2U/g) were found in 25% of classrooms and correlation analysis identified a strong relationship between asthma prevalence rates and mean levels of cockroach within the school (r=0.81, p=.001) as well as the mean levels of cockroach in different grades within the same school (r=0.71, p=0.008) (Amr et al, 2003, p. 37).

A multi-site study funded by the National Heart Lung Blood Institute (NHLBI) described multiple allergen levels in diverse schoolroom setting along with geographic and seasonal variation (Abramson et al., 2006, p. 248). Forty-one elementary schools in Birmingham, Alabama, Detroit, Michigan, and Houston, Texas were enrolled and samples were taken in fall and spring seasons (Abramson et. al, 2006). Samples were collected from cafeteria, library, and two classrooms (upper=3-5th grade and lower=K-2nd grades). Collection protocol was standardized and collected dust samples were analyzed for dust mites, cat, and cockroach.

Descriptive statistics were calculated for allergen samples and given that the results were nonparametric data and “not normally distributed, Kruskal-Wallis and Mann-Whitney tests were used to compare median concentrations” (Abramson et al., 2006, p. 247). Results varied depending on site, season, and classroom. Sensitization levels to all allergens were found in all Alabama schools with the exception of the cat in the cafeteria. Similarly, allergens exceeded threshold sensitization levels in all Texas
Fewer Michigan schoolrooms exceed threshold levels with the exception of cat and cockroach in library and dust mite in upper grade classroom (this was an unexpected finding and contradictory to previous studies).

**Building condition.** Interestingly, there was only one study found that examined the association between building condition and asthma exacerbations (Belanger, Kielb, & Lin, 2006). This retrospective population-based ecologic study included New York State enrolled children ages 5-18 years diagnosed with asthma over an 11-year period. International Classification of Diseases (ICD-9 code 493) was criteria for confirmed asthma diagnosis while exacerbations were measured by admission to hospital.

Asthma hospitalization data was retrieved from the Statewide Planning and Research Cooperative Systems (SPRCS), a mandated database containing demographic and diagnosis for all patients at acute care hospitals. In addition, census population files for both NYS population and US census data were used. Children receiving free or reduced rate lunches at the 716 existing schools were defined as poor. Although this does not capture all cases of poverty, it is highly correlated with a Spearman correlation coefficient = .87. An existing tool from the State Education Department namely the Building Condition Survey (BCS) examined school’s roofing, windows, exterior walls, floor finishes, furnace/boiler.

Geocoding was completed sorting the SPARCS demographics into NYS school districts statewide and school district asthma hospitalization rates were then calculated. Logistic regression controlled for poverty and hospitalization rates were linked to district school building conditions. Statistically significant results were found for exterior walls and floor finishes among all schools. School districts reporting higher rates of asthma
admissions had statistically significant results for roofing, exterior walls, windows, and floor finishes for boiler or furnace condition after controlling for poverty (p=<.05). Results demonstrated a positive association between poorly rated buildings and admissions for asthma exacerbations.

**Allergen in school and home environment.** A small study compared school and home allergen exposure in children with asthma. Settle and airborne samples were collected from 12 inner city elementary schools and bedrooms of children enrolled. Collections were completed twice in a one-year period fall/winter and spring/summer seasons. Collection methods were standardized and analyzed for cockroach, dog, mouse, dust mite, cat, and alternaria a common mold. T-tests were used to compare the two environmental samples and linear regression was performed to account for correlation from repeated measures. Results found higher animal levels in settled school samples compared to home however cat and dog were low “trace” levels. Statistically significant results were found for airborne and settle mouse allergen in school compared to homes (p=.0008) with a moderate correlation (r=0.48 p< .001). In contrast, cockroach levels were low (below sensitization) and equivalent in both home and school environment. Although dust mite allergen levels were also low overall, they were higher in homes when compared to schools (p=.0023). Dog (p=.0008) and cat (p=.0033) allergen were found at higher levels in school compared to home samples (Permaul et al., 2012).

Although not specific to school exposure The Inner City Asthma Study (ICAS) concluded that allergy sensitivity and allergen levels vary significantly depending on geographical location. The ICAS evaluated allergen sensitivities, allergen exposures, and associated morbidity for children living in inner city homes (Gruchalla et al., 2005, p.
Nine hundred and thirty seven children ages 5-11 years from five cities (Chicago, New York, Bronx, Dallas, & Seattle) were enrolled and underwent skin prick testing. Allergen samples from the child’s bedroom were collected and analyzed for dust mite, cockroach, cat, and dog. Over 60% of children were sensitized to cockroach and dust mite while 50% had a positive reaction to mold. Homes in Chicago, New York and the Bronx had higher than sensitization levels for cockroach than Dallas and Seattle whose dust mite levels were above sensitization. Children who had a positive cockroach allergy and had home exposure were found to have poorly controlled asthma control with more symptom days, more caregiver lost sleep, more missed school days, and a higher rate of unscheduled visits. The relative risk for hospitalization was 45% higher (RR 1.54 (0.93-2.54) 95% CI) when tracked over a two-year period. This relationship was not seen with dust mite sensitivity. However, allergy to pet (cat & dog) in combination with home exposure (living with pets) increased the risk of unscheduled visits RR 1.30 (1.00-1.92) and 1.45 (0.98-2.14) respectively (Gruchalla et al., 2005, p.483). The results of the study support that cockroach allergen and sensitization is a stronger predictor of asthma morbidity when compared to dust mite, or pet exposure.

As part of the ICAS, the School Inner City Asthma Study (SICAS) is a large-scale longevity cohort nearing completion in 2013. The study’s goal is to evaluate the role of indoor allergen, mold exposure specific to inner-city classroom environment and asthma morbidity (Phipatanakul et al., 2011). Over 500 children from 30 Boston elementary schools were enrolled (100 children/year). Power calculations were based on significance of p=.05 and two tailed test. Participants are followed every three months with a final follow up assessment at 12 months. Eligible children are seen at the Boston
Children’s hospital where questionnaires, blood samples, skin and pulmonary function testing are completed and follow up appointment scheduled. Settled and airborne samples will be collected at school and home (child’s bedroom). This is the largest comprehensive school based study to date and results will shed light on the interplay between home, school allergen exposure and correlation to asthma morbidity.

**In summary.** The literature reveals that there is evidence of the existence of school-based allergens however; allergen levels varied depending on geographical area, time of collection, and type of classroom. Exposure to high levels of allergen can contribute to sensitization resulting in asthma morbidity and mortality (Abrahams et al., 2006). Despite this “associating school environmental exposures to specific health symptoms is challenging, as it is difficult to separate the contribution of school-based and non-school-based exposures, such as due to the home environment, to an observed health outcome” (Chatzidiakou, Mumavic, & Summerfield, 2012, p. 229).

These study results demonstrate the challenges schools face in order to create a safe and supportive environment and highlight the need for further study. Future studies are needed to examine the relationship between optimizing the school environment (clean, pest free, allergen reduction, building condition) and asthma outcome measures (Abrahams et al, 2006; Amr et al., 2002; Tottolero et al., 2002). It will be interesting to see whether the results of the five year ICAS help to better understand the exposure risk factors specific to the school classroom.

**Health education and services**

Recognizing the challenges schools face, international organizations such as the World Health Organization (WHO), United Nations Children's Fund (UNICEF), and
United Nations Educational, Scientific and Cultural Organization (UNESCO) support the vital role schools have in health education and as health-promoting institutions (Clift & Jensen, 2005; Henry et al., 2004; World Health Organization, 2013). The World Health Organization provided a definition of a health-promoting school as "one that is constantly strengthening its capacity as a healthy setting for living, learning, and working. This includes providing a healthy environment, health education, and services, implementing policies and practices that respect an individual's well-being and dignity, and working with the community to understand more about health and education" (WHO, 2013).

In terms of health education and services, there were eight systematic reviews retrieved. Of these eight, four were discarded as one was adult based, one was a review of written asthma action plans only, one was review of computer based education program, one was repeated study published in 2002 and 2003 under different first author, in different journals. Of the four remaining, they were two examining paediatric asthma education programs and two for school-based asthma education programs. In addition, the writer’s independent review found 172 articles in which all titles were reviewed. Of those, 105 abstracts were read, 99 were left after duplicates were removed, 60 articles were pulled and 17 articles were reviewed along with the systematic reviews.

**In summary.** The literature reveals that there is evidence to support positive outcomes of school-based education with an increase in the development and delivery of asthma school programs over the past decade. 'In house' or school based health education programs have been successfully implemented in the US, United Kingdom (UK), Canada, and Australia (Asthma UK, 2006; Bartholomew et al., 2006; Cicutto et al., 2005; Gerald et al., 2006; Guglielmo & Little, 2006; Henry et al., 2004; Levy, Heffner, &
Beeman, 2006; Horner, 1998; Kolbe, 2005; Liao & Galant, 2004; Liao, Morphew, Amaro, & Galant, 2006; Magzamen et al., 2008; Mangan & Gerald, 2006; McGhan et al., 2004; McLaughlin et al., 2006; Mellis et al., 1994; Merkle, Wheeler, Gerald, & Taggart, 2006; Moonie, Sterlin, Figgs, & Castro, 2008; National Asthma Education and Prevention Program, 2007). School nurses where available, local asthma experts or public health nurses facilitated these programs that were diverse in terms of target audience, content, duration, and program tools. Verbal or telephone counseling; provision of electronic or written information such as on-line activities, CD rom, posters, pamphlets, and management plans; lunch time or after school group classes with students, teacher and parent in-service meetings are examples cited in the literature. Program topics included asthma physiology, environmental triggers, such as irritants from school renovations (fumes, dust, paint doors) and pets in the classrooms, trigger reduction strategies; preventing exercise-induced asthma; appropriate use emergency medications, and how to respond correctly and promptly to symptoms (cough, wheeze or whistling noise in the chest, shortness of breath, chest tightness).

The literature review for health education yielded eight systematic reviews. Of these eight, four were included given their relevance to this proposed study. Three meta-analysis examined health care utilization costs; statistically significant results (p<0.001) were found for decreased emergency room visits, school absenteeism, and days of restricted activity after children completed an asthma education program (Collins, Cabana, Halpen, & Yelin, 2008; Guevara, Wolf, Grum, & Clark, 2003; Murray, Low, Hollis, Cross, & Davis, 2007; Wolf, Guevara, Grum, Clark, & Cates, 2002). In terms of hospitalization or number of urgent physician visits, the results were mixed. There were
statistically significant decreases in the means of hospitalizations (Coffman, Cabana, Halpen, & Yelin, 2008; Guevara, Wolf, Grum, & Clark, 2003) however, only one quarter of the studies included by Ahmad & Grimes (2011) demonstrated a reduction in asthma hospital admissions post education. Lung function and self perceptions of asthma control were improved post education but not statistically significant (Guevara, Wolf, Grum, & Clark, 2003; Wolf, Guevara, Grum, Clark, & Cates, 2002). In addition, there was strong evidence to support that school based health programs improved academic success (p<0.02-.05) for math, science, & overall academic performance) for children with asthma (Murray, Low, Hollis, Cross, & Davis, 2007).

Sustainability of results beyond 12 months post intervention was not examined in any study. While results may not be generalizable given the different health care systems and that not all countries have access to school nurses, there was an overall decrease in school absenteeism, improved academic performance, and reduction in health care utilization demonstrating that more school-based education should be implemented within the school setting (Ahmad & Grimes; Coffman, Cabana, Halpen, & Yelin, 2008; Guevara, Wolf, Grum, & Clark, 2003; Murray, Low, Hollis, Cross, & Davis, 2007; Wolf, Guevara, Grum, Clark, & Cates, 2002).

The writer conducted an independent review examining paediatric asthma education initiatives since the Wolf et al., 2003 publication, to assess if education interventions improved both direct (health care utilization,) and indirect (quality of life measures, lung function testing, school absenteeism, work productivity). A randomized control trial (RCT) completed by the Children’s Asthma Education Centre (CAEC) at the Winnipeg Children’s Hospital set out to exam the effects of a small group interactive
education on asthma control by children and their caregivers. Target population was clearly defined as children, 3-17 years of age with a physician diagnosis of asthma along with their caregivers. Participants were excluded if they had a serious chronic illness other than asthma and language barrier. Study hypothesis was clearly stated as a 25% reduction in emergency room visits for the intervention group the year following study enrolment. The authors included secondary outcome measures namely hospital admissions, lung function measures, quality of life in the domains of symptom report, caregiver responses for work productivity, activity limitation, and caregiver smoking cessation. The CAEC completed a power analysis and determined that a sample size of 400 children (200 in each group) was required in order to provide a power of 80% with a p value of 0.05 or less which is considered to be statistically significant. In terms of results, both control and intervention groups experienced a decrease in ED visits the year following enrolment however, the intervention group had statistically significant reduction with a p value of p=0.0004 and CI 0.48\textendash0.81. Secondary outcome measures indicated similar results in terms of oral steroid requirement (p=0.001, CI 0.50\textendash0.82), work productivity (p=0.04), quality of life questionnaire in the symptoms domain report (p=0.03), second hand smoke exposure (p=0.019) when comparing intervention to control group (Watson et al., 2009).

**Liability and Asthma School Policy**

There were a total of 85 articles retrieved that addressed liability and school policy related to asthma management. Once duplicates were removed, 79 articles were considered. Based on title, 22 abstracts were pulled and of these, 13 were appraised and ten were included in the review.
**In summary.** Despite the significant decrease to both direct (hospital visits & medications) and indirect (work productivity & school absenteeism & quality of life) costs for asthma, school initiated programs help operationalize existing legislation and policies. Effective policy contains multiple programs and components. These include process to identify asthmatic child; outlines the school, parent, and child's responsibilities; improved communication between health care provider, school staff, parents, and child; facilitates staff in-services, curriculum development (incorporating asthma physiology, disease prevention and management); medication administration and storage; and crisis management (Henry, Lough, & Mellis, 2006; Hillemeier, Gusic, & Bai, 2006; McGhan et al., 2002; Newbould, Francis, & Smith, 2007; Pal, 2010; Sawyer, 2006; Snow et al., 2005). Legislation and policies have been implemented in various parts of the world in order to promote a safe and supportive school environment for students with asthma (Everett Jones, Wheeler, Smith, & McManus, 2009; Wheeler, Buckley, Gerald, Merkle, & Morrison, 2009).

There were many United States (US) publications containing reviews of the need for 'asthma friendly' school policies (American Association of School Administrators, 2006; Guglielmo & Little, 2006; Putman-Casdorph, & Badzek, 2011; Sawyer, 2006; Snow et al., 2005; Wheeler et al., 2009). Most of these recommendations occurred as a result of a death within the school setting and subsequent law suits. Based on these tragedies, childhood asthma networks mobilized and in October of 2004, US congress passed the Asthmatic Schoolchildren’s Treatment and Health Management Act that gave funding preference to states that protect student’s rights to carry and self-administer asthma medications at school (Allergy and Asthma Network Mothers of Asthmatics,
As of 2011, all fifty of the US states developed laws that protect the rights of children with asthma while in school (Allergy and Asthma Network Mothers of Asthmatics, 2012). In addition, Australia, UK, and New Zealand have implemented legislation that makes schools accountable for the protection and well being of the children with asthma (Putman-Casdorph & Badzek, 2004; Henry et al., 2004; Henry, Lough, & Mellis, 2006; Snow et al., 2005).

The integrative comprehensive synthesis of the evidence has identified “asthma friendly” schools as best evidence practice at an International level. However, it is important to next examine what is happening in Ontario and how does Ontario compare to its international counterparts?

**Best Evidence Practices Identified in Ontario**

In 1999 following the death of a young adolescent with asthma, a coroner's inquest and Ontario Chief Medical Officer (CMO) report identified gaps within school setting for asthma management making schools more ‘asthma friendly’ (D’Cunha, 2000). Recommendations were made by the inquest and CMO including the need for schools to provide a supportive, healthy environment for children with asthma. A school that addresses the CMO recommendations would be considered ‘asthma friendly’ and includes 1) a process outlined by the school boards and school staff to identify those students who have asthma; 2) easy and readily accessible medication for the student with asthma; 3) availability of information to educate staff and students about asthma and how to help those students affected; 4) collaboration with local health boards to assist school boards in responding to the issues around asthma such as healthy environments (reducing trigger exposure), and 5) policy development (e.g. guidelines around optimizing the
physical environment and managing activities for asthmatics in the school) (D'Cunha, 2000). Based on these recommendations, the Ontario's Ministry of Health and Long-Term Care convened an expert committee and working groups to develop a provincial asthma strategy resulting in an evidence guideline-based plan called the Asthma Plan of Action (APA) (Garvey & Lougheed, 2004). Two years later, four million dollars in annual funding for the APA's 13 initiatives was announced. One of these initiatives was the three year Public Health School Asthma Pilot Project (PHSAPP) that involved 170 schools, five public health units and five municipalities (Durham, Peel, Sudbury, Halton, & Hamilton). This multiple program initiative included implementation of an 'in house' six week evaluated asthma education program for grades three to five called the Roaring Adventures of Puff (RAP), an Asthma Friendly Schools Resource Kit to support school staff in optimizing asthma management in schools, a child and youth public education project, and an Asthma in Schools website endorsed by Ministry of Health and Long-Term Care, Ontario Lung Association (OLA), Ontario Physical Health and Education Association (Ophea), and public health units. In addition, the PHSAPP held asthma in-service teaching session for school boards, administrators, teachers and school staff along with parent information evening (Garvey & Lougheed, 2004). The overall goals of the pilot project were to create asthma friendly and supportive school environments so that children with asthma could manage their asthma successfully (Cicutto et al., 2006). With optimal management, school absenteeism, days of interrupted activity and health services use for children with asthma were reduced (Cicutto et al., 2006; Conti et al., 2007). Goals were met, and based on pilot successful results, the APA pilot school initiative
received funding to continue as a permanent program in four of the five original sites.

Recognizing the tremendous benefits of this program and fiscal limitations, the Ministry of Health and Long-Term Care created a "Train the Trainer program" in order to assist in disseminating the program across the province (Cicutto et al., 2006).

These APA school-based initiatives were further supported by the Ontario Education Law that states “reasonable measures need to be in place to enable adequate care for the student with asthma or anaphylaxis in order to avoid serious health problems and subsequent absence from school” (Brown & Zucker, 2007, p. 290). At the beginning of the school year, registration forms are sent home for parents to complete and are to include any health issue or medication required; physician signature and clear medication instructions are necessary. The Ontario Education Law stipulates that school administrators have a legal obligation to assist in managing medical condition or treatment when doing so is in the best interest of the student. Legislation “demands” that an administrator delegate staff to administer care and medication for students. A subsection of the Law clearly outlines administration instruction of medication to “Asthmatic or Anaphylactic Children”. The law states that,

"Reasonable measures need to be in place to enable adequate care of the student so as to avoid any serious health problems and subsequent absence from school. While the onus is on the parent as primary caregivers to inform the school of their child's medical condition, it does not necessarily release the school of responsibility….The teacher's role is to… monitoring the at-risk child for any allergic reactions, ensuring that pupils inform any teacher should they notice any health problems of any of their classmate, verifying that the Epipen® or medication for asthma is on the child and that a back up exists in the school….Ultimately a duty of care rests upon the parent who must disclose promptly and honestly a child's medical condition, sign required consent forms, ensure that a physician has apprised the school authorities of appropriate measures, and procured an adequate number of inhalers." (Brown & Zucker, 2007, p. 290-291).
Conclusion

Synthesis of literature evidence demonstrated that asthma management in schools is indeed a problem at an international, national, and provincial level. Best practice evidence was identified along with how these are being implemented and backed by policy. However, even when legislation exists, optimal asthma management policies are not always implemented or enforced. Differences among practices may be related to the fact that management and administration of asthma medications are left up to the individual school administrator. In addition, principals are not always aware of school board policies related to asthma medication use let alone provincial legislation mandating children to carry puffers themselves (Cicutto et al, 2006). Support, collaboration, and partnership are necessary in order for schools to be health-promoting institutions.
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National Association of State Boards of Education. Year *State School Health Policy Issue*


Table 1

Literature Review Summary

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Initial Search
1079

Abstracts not on Topic

793

Relevant Topic

286

Appraised with CASP
146

Excluded
79

Kept
67
Figure 2. Knowledge to Action Framework Phase One

Figure 2. Taken from “Lost in Knowledge Translation: Time for a Map?” by Graham, Logan, Harrison et al., 2006, Journal of Continuing Education in the Health Professions, 26, p. 19.
Chapter Three

Is There a Practice Gap?
Abstract

Purpose: To assess current asthma management practices reported by school administrators within public schools in one Ontario Region.

Method: An exploratory cross-sectional design was used in a convenience sample of 61 school administrators (63% response rate) within two district school boards. Strategies suggested by Dillman et al. (2009) were used to maximize the response rate. Descriptive statistics were used to analyze survey results and content analysis used for free text comments.

Results: Communication was the most common barrier identified by school administrators and it was multi-directional (parent to school, parent to child, school to parent, school to child, board to school, school to individual staff). Additional findings included: 1) underestimation of the prevalence of asthma; 2) no standardized process for identifying children with asthma; 3) training deficiency for recognizing and responding to asthma exacerbations; 4) lack of individual asthma action plans for children with asthma; and 5) absence of programs to support current legislation and best practice guidelines.

Conclusion: Given the barriers identified within the survey, there is support for the potential to expand the clinical tasks currently undertaken by nurses whether in public health, community based practitioners, or clinical nurse specialists. Policy and procedures require clarification and standardization. Nurses can help schools not only manage the growing burden of childhood asthma but also help schools reach their academic and legal responsibilities ensuring they become health-supporting institutions.
The school setting remains one of the most critical context for asthma prevention, education, and management (McAleavy & McCrystal, 2007; Snow, Larkin, Kimball, Iheagwara, & Ozuah, 2005). Legislation and policies have been implemented in various parts of the world in order to promote a safe and supportive school environment for students with asthma (Everett Jones et al., 2004; Wheeler, Smith, & McManus, 2006; Wheeler, Buckley, Gerald, Merkle, & Morrison, 2009). While legislation was designed to ensure a safe environment and optimal asthma management within the school setting, school boards have a responsibility to create policies that support and align with existing law (Cicutto et al., 2006). Many schools do not have standardized policies, education or clinic programs regarding asthma management (McGhan et al., 2004). While principals are the gatekeepers of school programs and procedures (Hone-Warren, 2007), they are not always aware of school board policies related to asthma medication use let alone provincial legislation mandating children to carry puffers themselves (Cicutto et al., 2006). In addition, optimal management policies are not always implemented or enforced (Cicutto et al., 2006).

Prior to commencing the study, a personal interview was completed with members of the public health unit school team, thesis supervisor, and district school board representative to discuss management practices within the schools and study proposal. There was support for moving forward. At a local level there were no specific asthma school policies provided by either of the two study district school boards. According to one Board, it is the individual principal who decides how asthma will be managed within the school (Personal communication, January 19, 2012). These findings highlighted the need to first assess management practices at a local school level.
Research Questions

Given that principals are the gatekeepers for school programs and policies, the primary research question for phase two was, "What are the current practices reported by school administrators for managing children's asthma within public schools in one Ontario region?" Secondary research questions included, “How do these reported practices align with best practice and legislation?” and “What if any are the barriers identified by school administrators for asthma management within context of the school setting?”

Study Design

In order to answer the research questions posed above, an exploratory cross-sectional design (survey) was chosen to provide a description of the phenomenon at one point in time (current practices for asthma management among school administrators) (Polit & Beck, 2012). This study phase was grounded within the Knowledge to Action Framework (Figure 2) and focused on highlighted sections including *Adapting Knowledge* (Current Legislation & Best Evidence) to *Local Context* (English schools) and *Assess Barriers to Knowledge Use* (appropriate asthma management).

Population, Sample and Recruitment

Inclusion criterion for study enrolment was English-speaking schools within the public district school boards. French schools were excluded as survey tool is in English and this is the first study in this Ontario Region. Within the two district school boards of interest, ninety-seven out of one hundred and ten public schools were identified and were eligible for study enrolment (Table 2).
Method

The Queen’s University Health Sciences and Affiliated Teaching Hospitals Research Ethics Board approved the study (Appendix A). External research study applications for both public district school board (two required-elementary & secondary programs) and Catholic public district school boards were submitted and approved. A request to introduce the study at the monthly administrators’ meeting was declined by both school boards. However, the public board superintendent distributed the study information letter (Appendix E) at one administrators’ meeting.

Data Collection Tools and Plan

The study data collection tools were mailed as a complete administrator package. Administrator study packages included a copy of the information letter (Appendix E), demographic questionnaire (Appendix F), and survey (Appendix G). Administrators of more than one school were required to complete additional survey(s) for each site. Study packages included a return paid postage envelope. The data collected was descriptive in nature and was not part of the previous Asthma Plan of Action’s Public Health School Asthma Pilot Project.

In terms of the Administrator survey, a search for a valid and reliable tool was unsuccessful. In fact, a systematic review of asthma questionnaires demonstrated that of reviewed tools none met all of the psychometric properties of content validity, construct validity, criterion validity, internal consistency, and reproducibility (Pink, Pink, & Elwyn, 2009).

The Centers for Disease Control and Prevention (CDC)’s School Health Profile Principal Questionnaire (SHPPQ) was chosen for the study with minor edits to make it
more appropriate to the Canadian context. This tool was developed by experts and has content validity (personal communication, CDC, September 2012) and was field-tested for readability and user-friendliness (CDC, 2008). Housed on the School Health Index website, the SHPPQ was created to “help schools understand their strengths and weaknesses, to develop an action plan for improving their health policies and programs related to asthma and other health topics” (CDC, 2008). In addition, this tool was chosen as it addressed the components required for an “asthma friendly school” and those outlined in the Ontario Education Law including: identification process, easy and accessible medication, reduction of triggers, supportive school programs and policies for students with asthma.

Survey Response. To increase the number of surveys returned, a total of three follow up reminders were completed (Dillman, Smyth, & Christian, 2009). A five dollar coffee card was mailed to participants as a token of appreciation for their time with the third and final reminder notice. In the final notice mailing, another postage paid envelope and copy of the survey was included, in case the first one was misplaced.

Preparing packages

To ensure confidentiality of participants, there was no identifiable data found on the surveys themselves. An excel spread sheet was created based on both Boards’ listing of current schools and administrators. As per study protocol, French Immersion schools were excluded in the mail out. Each school was given a unique identifier code and coding sheet was kept as a separate password protected file.

Data Management and Analysis

In total there were 10 questions and data analysis was completed using Statistical
Descriptive statistics were utilized for collected demographic information (administrators’ gender, years of experience, type of school either elementary or secondary, total student population per school) and survey responses (categorical data) reported by means, standard deviation, frequencies or percentages. Administrators’ reports of current practices and how these compare to Ontario Education Law were addressed by survey questions 2, 3, and 7. Review and confirmation of the data entered into the excel spreadsheet and SPSS® database was completed twice to ensure it was accurate complete, and free or error (Tabachnick & Fidell, 2001). Once the database had been verified for its accuracy and completion, all quantitative data were reviewed for completeness. Quantitative data were analyzed to describe the sample characteristics and to answer the research questions.

**Open-ended and Text Survey Questions**

Inductive content analysis was identified for the three open-ended survey questions (2e & 10 & 11) given the little research available in this particular area. Transcribed word for word onto an excel document, words were assigned codes for exploration then categorized (Elo & Kyngas, 2007). Grouping of data according to codes allowed for higher order categories to be created (Hsieh & Shannon, 2005; Schreier, 2012). This was a sound method of describing the responses, to increase understanding and to generate knowledge (Hsieh & Shannon, 2005). The process of the data analysis was detailed to ensure validity and trustworthiness of the findings (Elo & Kyngas, 2005; Hsieh & Shannon, 2005). Reliability was assured by linking results back to the data (Polit & Beck, 2012). Inter-subjectivity was secured by having supervising professor double checked data.
Survey Results

School Principal Questionnaire

Out of 97 surveys that were mailed, the total response rate was 61 (63%). Administrators who responded to the survey were mostly women (n=44; 72%) compared to men (n=17; 28%).

There were no administrators in the 25-29 years of age category, (n=5; 8.2%) were between 30-39 years, (n=30; 49.2 %) were between 40-49 years of age, (n=24; 39.3%) were between 50-59 years of age, and only (n=2; 3.3%) were 60 years plus. Close to 90 % of respondents were between ages 40-59 years of age.

Years in current administrator role ranged from 0.5 to 20 years with a mean of 3.92 years (SD 3.75). Total years of administrative role ranged from 2-26 years; mean 8.68 (SD 5.12).

Type and Characteristics of Schools

Break down for returned administrator surveys were as follows: Catholic (n=24; 39%) and public schools (n=37; 61%). There were (n=51; 84 %) elementary schools compared to secondary schools (n=10; 16%). Of these, 87.5% were Catholic elementary and 12.5 % were Catholic secondary. Public elementary represented 80.5 % and 19.5 % response rate from secondary programs.

Schools population ranged in size from 21 up to 1180 student. The mean number of students within a school was 327.41 (SD 268.87). Frequency of grades in schools included Grades 7-12 (n=1; 1.6%), grades 7-8 (n=2; 3.3%), grades 9-12 (n= 10; 16.4%), junior kindergarten to grade 12 (n=1; 1.6%), junior kindergarten to grade 3 (n= 1; 1.6%), junior kindergarten to grade 6 (n=3; 5%), junior kindergarten to grade 8 (n=43; 70.5%).
**Administrator Survey**

Children identified as having asthma totaled 647 with a mean of 11.98 per school (SD 14.58). There was a large range reported by administrators for children with asthma from 0 to 79 per school. Four administrators were not aware of specific number of students with asthma and three did not respond.

In terms of identifying a child with asthma, the most common response was medication form (75.4%), followed by parent note (73.8%), form or letter from health care provider such as doctor, nurse practitioner, specialist (55.7%), other (23.0%) primarily registration form, does not have a process to identify students with asthma (6.6%) while did not know (1.6%). Administrators were allowed to choose multiple responses when applicable and therefore results total greater than 100%.

A review of asthma action plans determined that (n=11; 18.0%) schools had action plans on file for all students with asthma, most students (n=11; 18.0%) and some students (n=15; 24.6%) had a plan on file, (n=18; 29.5%) had no action plan on file for students with asthma, (n=4; 6.6%) stated there were no children in their school with asthma, and (n=2; 3.3%) did not respond to this question.

In terms of components of an asthma friendly school, only two schools within the two district school boards met the criteria by answering yes to each of the seven sub questions for question four, identified an identification process (question 2), and a medication policy in place (question 7). Almost half of schools (n=30) ensured a written asthma action plan is on file. Medication, spacer, and peak flow meter access were available at 70.5% (n=43) schools. Minimizing triggers was undertaken by 68.9% (n=42) of schools, 29.5% (n=18) do not address triggers, and 11.6% (n=1) stated not applicable.
Addressing social and emotional needs for children with asthma was only completed by 39.4% (n=24) of all schools whereas the majority did not 59% (n=36) and 1.6% (n=1;) did not respond as there were no children reported with asthma in the school. Twenty-three percent (n=14) of the school administrators provide additional psychological counseling or support services as required. This was compared to 75.4% (n=46) and 1.6% (n=1) did not complete, as there were no children reported with asthma in the school. Ensuring access to safe, enjoyable physical education and activity opportunities was reported in 90.2 % (n=55;) of schools, with 6.6% (n=4;) not addressing this issue, and 1.6% (n=1); stating there were no children with asthma in their school. There was one missing response (1.6%). Close to 87% (n=53) of administrators provided students with access to medication prior to physical activity, with 11.5% (n=7) not addressing this issue, 1.6% (n=1) stating it was not applicable as there were no children with asthma in their school, and 1.6 % (n=1) did not response.

Eighteen percent (n=11) of administrators reported contacting community resources within the past year. With information was most often sought from the Public Health Unit. Thirteen percent (n=8) of administrators reported approaching Public Health Unit for information, followed by 11.5% (n=7) contacting Ontario Physical and Health Education Association (Ophea); and 1.6% (n=1) the Ontario Lung Association. Interestingly, the local Regional General Hospital’s Asthma Education Centre was never accessed as a community resource for information. As multiple responses were allowed, totals do not equal 100%.

Training on recognizing and responding to severe asthma was not a requirement in 57.4% of schools (n=35), 26.2% of school (n=16) reported once per year, 11.5%
schools (n=7) did not know, 1.6% (n=1) stated every other year, 1.6% (n=1) administrator responded more than once per year, one administrator did not respond.

Sixty two percent of administrators reported there was a school policy in place supporting students to carry and self-administer asthma medication. A process for informing students and parents about the school medication policy were 55.7 and 60.7 % respectively.

Responsibility for implementing the school’s policy permitting students to carry and self-administer asthma medication was reported by principals in 52.5 % of cases, followed by no single individual 19.7 %. Although the question specified for only one response, there were 14.8% (n=9) combinations answers. For example, principal and vice principal n=3, principal and individual teacher n=2, principal, individual teacher, other school faculty or staff member, assistant principal and individual teacher n=1, assistant principal and does not apply n=1, principal and other school faculty or staff member n=2.

There were four administrators (6.6%) who expressed interest in participating in an administrators’ meeting. The majority of principals declined (n=55; 90.2%), (n=2; 3.3%) did not respond on the survey.

**Open Text Survey Results**

In terms of identification (open text question 2e), the most common method was via a “form”. Table four provides a breakdown of all responses with the most commonly identified process as the registration form. There was one response removed from the final table, as the meaning was unable to be verified.

When asked to identify the barriers to asthma management within the school setting, there were 40 responses. Five subcategories under “Barriers” were identified
including Partnering and Cooperation, Available and Accessible Resources, Perceptions of Severity, Environmental Triggers, and None.

Partnering & Cooperation (n=26; 65%) was most common category and identified both communication (n=19; 47.5%) and accountability (n=7; 17.5%) as obstacles for asthma management within the school setting. Communication (just stated it was a barrier, therefore don’t need to repeat again) was multidirectional with parent to school, parent to child, and student to school. Comments centered on need for cooperation, identification of student with asthma by parent, and the importance of following school protocol. For example, “Ensuring consistent communication between necessary stakeholders.” “The system will only work if everyone (parents, students, staff) cooperate and communicate with one another.”

Overlap was noted for comments regarding communication and lack of resources specifically regarding identification of a student with asthma. For example, “Parents not informing the school if their son/daughter has asthma”. “Accurate and current information from parents.” Accountability responses identified lack of adherence for reporting, not following school procedure, not being honest for both students and parents. Comments included, “Sometimes getting paperwork back from parents is an issue.” “We ask parents at the beginning of the year and occasionally throughout the year to keep us informed of changes to students’ medical conditions/needs. Some tell us and others do not so in some cases are hands are ‘tied’ about implementing a consistent approach.”

More than half (n=21; 52.5%) of responses fell under “Availability and Accessibility” (n=15; 37.5%) specifically identified “Lack of Resources”. Examples included information, knowledge, forms, medication, financial, workload, and one of
many issues. Policy & Protocol (n=7; 17.5%) was also placed under category and included lack of board policies, no formalized procedure to identify students with asthma, no consistent procedures for asthma and its management within the school setting. Comments included, “We need to have a plan in place for making things more procedural.” “Develop our procedures”.

Perceptions of Severity (n=3; 7.5%) identified that administrators consider only students with “severe” asthma a concern. Comments included “Only severe cases are an issue for us.” and “The students at our school do not have very serious asthma symptoms.”

The school environment (n=2; 5%) was identified with dust and scents as the only triggers discussed. There were four administrators (10%) who stated there were “no barriers” to asthma management within the school setting.

Discussion

The results from this study have illustrated that there is no standard approach in terms of asthma management within the schools. Current practices have highlights for discussion include identifying students with asthma, underestimating prevalence, deficiencies in staff training, individualized asthma action plans, student services, and the need for standard procedures that are supported by policy.

Identifying students with asthma & underestimating prevalence. Within the province of Ontario, prevalence rates for childhood asthma is approximately 21% (OASIS, 2010). Administrators identified a total of 19,972 students enrolled within the 61 participating schools. When asked to identify number of students with asthma, there were three administrators that were “uncertain” and four who reported “no children with
asthma”. These results are surprising. Using the provincial childhood prevalence rate, 4194 students have asthma within the two district school boards. Even if conservative estimates were utilized; (i.e. using 14.39%; the provincial rate of all age groups), 2,874 children are living with asthma (To et al., 2004). Interestingly, administrators reported only 647 children who have asthma, a number that represents only 3.24 % prevalence. This low prevalence report highlights the urgent need for clearly identifying students with asthma within the two district school boards.

This discrepancy may be compounded by lack of standard identification process. These results are consistent with a previous Ontario study where less than 50 % of schools reported a standardized process for knowing which children have asthma (Cicutto et al., 2006). While most administrators identified a process, there was not a universal approach among schools. In addition, “parents not providing appropriate forms” and “parents not informing schools of their child’s diagnosis” were frequently listed as a barrier for optimal management within the school setting. Six percent stated there was no process.

**Deficiencies in staff training.** In Canada, 287 Canadians died of asthma (Health Canada, 2006) with more than 80 % of these deaths being preventable. In 1998/1999 five percent of paediatric deaths were attributable to asthma (To et al., 2004). In 2007, there were 1297 total paediatric deaths in Ontario (Office of the Chief Coroner, 2010). There was no Canadian data examining school-deaths related to asthma. However, in a US study, 33 % of asthma deaths in school were directly attributed to inadequate staff training (Greiling, Boss, & Wheeler, 2005). Given how common asthma is and that asthma exacerbation can be fatal within one hour from the onset of symptoms (Robertson
et al., 1992), it is vital that schools address this issue. Children are placed at even greater risk when there is no standardized identification process. Without proper documentation and training, staff may fail to recognize the onset of exacerbations and not realize the seriousness of the situation. As of 2011, all US states have legislation in place to protect children with asthma, the majority of which was related to a child’s death and subsequent law suit (Allergy and Asthma Network Mothers of Asthmatics, 2012).

In this study, more than two thirds of schools reported no training for recognizing and responding to worsening asthma. Additional research has demonstrated the inadequate preparation of school staff to manage asthma exacerbations (Cicuttoto et al., 2006; Fillmore, Jones, & Blankson, 1997; McGann et al., 2002; Putman-Casdorph & Badzek, 2011). Two thirds of United Kingdom (UK) school administrators articulated that ‘coping with an asthma emergency’ was a concern and that 78.9 % would like to see “asthma training as a regular component of staff development” (McCann et al., 2002, p. 186). This is in keeping with a Canadian study that reported principals and teachers were interested in receiving additional training in asthma management and did not feel confident in managing exacerbations (Cicutto et al., 2006).

Approximately 60 % of deaths occurred within the first hour of exacerbation onset (Robertson et al., 1992). Although dated, this Australian study was one of the first to examine asthma related deaths for individuals less than 20 years of age. Of 51 deaths identified over a three-year period, one third had mild asthma and one third had never been treated in hospital. In 68 % of cases inadequate assessment and inadequate treatment were contributing factors. Although not specific to school deaths, this study highlights the need to ensure adults who are caring for students with asthma have a clear
individualized crisis plan (Robertson et al., 1992). A one more recent US research study examined school deaths related to asthma between 1990-2003 and events that contributed to these deaths (Grieling, Boss, & Wheeler, 2005). Of 38 deaths reported, the majority were adolescents (72%), occurred while children engaged in physical activity (42%), of children died waiting for medical assistance due to delay in assistance or staff hesitancy to provide medical assistance (31%) (Grieling, Boss, & Wheeler, 2005).

**Individualized asthma action plans.** Individualized asthma action plans (AAP) are the staple of education programs. They provide step-by-step instruction for how to appropriately manage asthma, symptoms of worsening asthma, and when to seek emergency assistance (911) (Ducharme et al., 2008). In this study, close to one third of schools reported having no asthma action plans on file for students with known asthma. These results were in keeping with other research that noted few individualized asthma action plans on file for students (Hillemeier, Gusic, & Bai, 2006; Sapien, 2007). Given the previous discussion regarding lack of staff training to respond to asthma, it is important that individualized action plans are provided to the schools by parents upon enrolment and updated annually.

**Student services.** Administrators in this study scored high on ensuring safe, enjoyable physical education, activity opportunities (90.2%), and easy access to medication before physical activity when needed (86.9%). However, there was little psychosocial support for students with asthma with 23% addressing this issue. In addition, 59% of schools did not addressed social and emotional issues related to asthma.

When asthma is uncontrolled, children experience school absenteeism, nighttime sleep disturbance, limited physical activity, and overall decrease quality of life measures
(Lougheed et al., 2012). Many psychologically based treatments such as relaxation and guided imagery, stress management, yoga to promote a sense of well being and improved physical health of children whose asthma exacerbations are triggered by emotions (Bray et al., 2008). Recognizing the importance of social and emotional issues and how they affect asthma, many in-house education programs provide interventions to address these concepts. A systematic review of school based educational interventions determined statistically significant results (p<0.001) in terms of reduction in missed school days in six of nine studies, half of the studies had statistically significant results for reduction in emergency room visits, and one quarter demonstrated reduction in hospitalization for asthma (Ahmad & Grimes, 2011). In one Ontario study, children allocated to an education intervention arm of a randomized control trial had statistically significantly overall improved quality of life measures (activity, symptoms, emotion) compared to those who did not receive education (Cicutto et al., 2006).

**Need for standard procedures that are supported by policy.** Just over two thirds of administrators reported there was a policy that allowed students to carry and self-administer asthma medication. This was closely matched by a procedure to notify students and parents about the in-house policy. One school administrator documented along the side of the survey that while there was a school policy in place for children to carry and self-administer asthma medication that younger children (primary, junior, and intermediate grades) “had their puffers stored in the office and are used as needed under the supervision of office staff”. In fact, this administrator noted it was only grades 7-8 students who were permitted to carry and self-administer provided they were deemed ‘mature’ enough by school staff after discussion with individual parents.
These results were surprising and were in direct contrast with previous research. A UK study, found that 75.8% of children (elementary through secondary schools) were not allowed to self-administer, 45.4% were not allowed their medication prior to physical education class, and only eight% of schools had documented policies for asthma medication storage and administration (McCann, 2002). In other studies, there was a significant range with 32-56% of students not allowed to self-administer (Chakraborty & Hamer, 2005, Cicuttto et al., 2006; Johnson & Hayes, 2006). Perceived lack of standard policy for medication administration in schools was a common concern among parents in qualitative studies (Barrett, Gallien, Dunkin, & Ryan, 2001; Buford, 2004; Horner, 1997; Meng & McConnell, 2002) with students required to hand in their medication to the office upon arrival to school (Snow et al., 2005).

**Identifying Best Practice.** The results from this study identified best practices is the provision of a supportive, healthy school environment for students with asthma (WHO, 2007). A school that does so would be considered “asthma friendly” and includes the following: a process outlined by district school boards and school staff to identify those students who have asthma; easy and readily accessible medication for the student with asthma; availability of information to education staff and students about asthma and how to help those students affected; collaboration with local health boards to assist district school boards in responding to issues around asthma such as health environments (reducing trigger exposure) and; policy development (e.g. guidelines around optimizing the physical environment and managing activities for asthmatics in the school) (D’Cunha, 2000).
This is consistent with best practice identified in other countries (Everett Jones & Wheeler, 2004; Henry et al., 2006; Snow et al., 2005; Wheeler et al., 2006; Wheeler, Buckley, Gerald, Merkle, & Morrision, 2009). In this study, only two administrators’ surveyed met the criteria for “asthma friendly” school.

**Legislation.** The Ontario Education Law specified that the parent is responsible to promptly notify the school of their child’s medical condition, to complete required consent forms, and to ensure the doctor has apprised the school of appropriate measures. However, it stresses that the school is not without responsibility. The teacher must monitor the ‘at risk child’ and that the medication for asthma is on the child and that a backup exists in office (Brown & Zucker, 2007). Ensuring school administrators are aware of and adhere to the Ontario Education Law is not a simple task and there is a need for collaboration between key stakeholders. Almost 60 % of administrators reported parents not identifying students with asthma as a primary barrier. Change in practice is a complex process that needs to be backed by a “policy that is flexible, comprehensive, and supportive of collaboration among various sectors including education and health” (McGhan et al., 2002, p. 112).

**Barriers Identified**

**Partnership and collaboration.** Communication issues and lack of accountability were identified as most common barriers in the survey responses. The issue was between parents as well as minimal collaboration with community partners (school staff, school board, public health school staff) regarding asthma management. As part of the provincial Public Health Asthma School Pilot Project, school staff surveyed stated they felt overwhelmed and wanted help managing asthma within the school setting (Cicutto et
al., 2006). When asthma is well managed, there is improved academic performance and less school absenteeism (Moonie et al., 2008). Given the myriad of behavioural and health issues, along with academic pressures school staff must address; partnering and collaboration could be of benefit. Bringing key stakeholder together to discuss and develop a strategic “asthma friendly school” plan should be next priority.

**Strengths**

Strength of this study is the presentation of novel data. This Ontario Region was not included in the original Ministry of Health and Long-Term Care’s Asthma Plan of Action Public Health Asthma School Pilot Project. This study not only provided insight into the disparity of reported practice for this Ontario Region but also captured the range and depth of asthma management practices. The study methodology used a phased action approach grounded within the Knowledge to Action framework. Acquiescence was avoided as the survey did not include any agree or disagree types of questions (Dillman et al., 2009). Administrator survey was followed up with key informants meeting to verify study findings and explored administrators’ experiences with asthma and identify new research questions. This study itself has demonstrated that policy and procedures required further clarification and standardization.

**Limitations**

**Timing of Study.** The study coincided with a contractual dispute between teachers and provincial government. However, Catholic schoolteachers’ union negotiated a contract prior to the study start date. Interesting to note, the final response rates were 61% within the public district school board compared to the Catholic board response rate of 67%. The political situation may have been reflected in the final survey response rate
with a higher response rate from the Catholic Board despite the fact that the study was not introduced at the administrators monthly meeting.

A second limitation was generalizability. In order to determine generalizability of the study participants, demographic information was compared to provincial statistics. The demographic composition of the study suggested an underrepresentation of male administrators. When compared to Ministry of Education data (2010-2011), gender break down was slightly higher in the current study with 72.1% women (compared with reported average of 60.3%) and 27.9% of male study participants (compared to 39.7% provincial rate). Looking at the individual district school boards, public boards reported 72% women and 28% of elementary school administrators are men. The Catholic board reported higher percentage of male elementary administrators at 47.2%. In terms of secondary schools, public board had only 18.2% men compared to the Catholic Board at 60%. Administrators Table 5 and 6 outlines 2010-2011 (most recent) provincial statistics on administrator data.

Social desirability is less of an issue with self-administered questionnaires however; it can be a form of bias and must be considered (Bowling, 2005). The survey relied on self-reported data, which was not verified. This is a limitation with all self-reported studies.

**Considerations for Moving Forward: Implications**

**Practice Implications**

Canada unlike its US, UK, Australia counterparts do not employ school nurses. Dissemination of evidence-based tools (administrator asthma DVD resource) has occurred. In order to move the resources into practice, expanding the clinical tasks and
advocacy role currently undertaken by nurses whether in public health, community based practitioners, or clinical nurse specialists must be considered.

Working with the district school board and administrators, paediatric asthma educators and primary care providers should advocate for children with asthma by completing school based student asthma management plan (Appendix M). This would not only identify students to the school, a primary barrier determined by the study but also assist in appropriate management and facilitate better communication among parents and school staff. In addition, paediatric asthma educators deliver evidenced based children’s education programs that focus on disease control and self-management. These sessions could be provided over the students’ lunch hour ensuring academic time is not lost. Given their training and expertise in health policy and community networking (McGhan et al., 2002), public health nurses should be leaders in this initiating practice change. Acting as the distribution agent, linking resources, and facilitating staff training on teacher’s professional days could be incorporated within Public Health nurses’ role.

School based health clinics (SBHC) are a new model of Canadian healthcare for children that are receiving positive results (Hammer & Dakshana Bascaramurty, 2012). These clinics have been established in other countries and are designed to address public health issues with little funding such as keeping children out of busy emergency rooms, offer diagnosis and treatment (Oruwariye et al., 2003; Webber et al., 2003; Yawn et al., 2002). Clinics are set up in an unused classroom and teachers refer students to the clinic throughout the day. In some Canadian cities, paediatricians run the clinics such as Saskatoon, Vancouver, and Montreal. However the most recent pilot clinic in Toronto Ontario is following a different model. Salaried Nurse Practitioner deliver care so the
Ministry of Health and Long Term Care does not have to pay a physician. The Toronto pilot clinic is currently funded by donations from a not for profit organization called the Toronto Foundation for Student Success (Hammer & Dakshana Bascaramurty, 2012). School based clinics have the potential to be the most efficient way to improve the health of children and their academic achievement (Kolbe, 2005, p. 226). Governments can secure not only economic benefits by pairing of schools and SBHC, but also the long term social and health gains for children (Richardson, 2007).

**Policy Implications**

Consideration must be also given to the development of policy that will ensure schools are able to provide a safe and supportive environment. Although the Ontario Education Law provides a framework of support, it does not address all areas recommended by the coroner’s inquest and Chief Medical Office of Health's report. It does not go far enough. Engaging multiple key stakeholders who have a vested interest will help ensure ownership and success of making all schools asthma friendly. Local district school boards need to adopt and implement evidence based tools such as the Asthma Friendly School Resources. In addition, written policies that support these initiatives need to be developed and executed. Consideration should be given to appointing a governing body to monitor adherence and implementation of legislation and school based programs (Cicutto et al., 2012). This is especially important because without adequate support (financial & human resource) implementation strategies will fail; there will be no change within the school setting (Cicutto et al., 2012).
Conclusion

The school setting remains one of the most critical contexts for asthma prevention, education, and management. Findings from the administrator survey are similar to literature review results discussed in Chapter two. Survey responses identified that asthma management and practices vary and there is not a standard or consistent approach. Differences among practices may be related to the fact that disease management is left up to the individual administrator. However, principals are not always aware of school board policies related to asthma, best practice, or provincial legislation. The evidence identified a knowledge and practice gap placing children with asthma at risk within the school setting. Discussions regarding expanding nursing role within the school should be considered. By partnering with schools, nurses could assist schools manage the growing burden of childhood asthma.
References


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Medicine, 157(2), 125-129.


Table 2

*Schools Boards of Interest for Proposed Study*

<table>
<thead>
<tr>
<th>School Board</th>
<th>Total number of Schools</th>
<th>Total Number of English Public Schools</th>
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<td></td>
<td>11</td>
<td>11 Secondary</td>
</tr>
<tr>
<td>Public District Catholic</td>
<td>36</td>
<td>31 Elementary</td>
</tr>
<tr>
<td>School Board</td>
<td>11**</td>
<td>5 Secondary</td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>97 Eligible For Study</td>
</tr>
</tbody>
</table>

**Six schools were identified as secondary adult continuing education**
Table 3

*Summary of Responses to Demographic Questionnaire*

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th>Number</th>
<th>Mean</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years in Current Administrative Role</td>
<td></td>
<td>61</td>
<td>3.91 (SD 3.75)</td>
<td></td>
</tr>
<tr>
<td>Total Years as School Administrator</td>
<td></td>
<td>61</td>
<td>8.68 (SD5.12)</td>
<td></td>
</tr>
<tr>
<td>Gender: Male</td>
<td></td>
<td>17</td>
<td>N/A</td>
<td>28%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>44</td>
<td>N/A</td>
<td>72%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29 years</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>30-39 years</td>
<td></td>
<td>5</td>
<td>N/A</td>
<td>8.2%</td>
</tr>
<tr>
<td>40-49 years</td>
<td></td>
<td>30</td>
<td>N/A</td>
<td>49.2%</td>
</tr>
<tr>
<td>50-59 years</td>
<td></td>
<td>24</td>
<td>N/A</td>
<td>39.3%</td>
</tr>
<tr>
<td>60+</td>
<td></td>
<td>2</td>
<td>N/A</td>
<td>3.3%</td>
</tr>
<tr>
<td>Total # of Students Enrolled</td>
<td></td>
<td>19,972</td>
<td>N/A</td>
<td>327.41(SD268.87)</td>
</tr>
<tr>
<td>Total Grades in the School</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JK-Grade 3</td>
<td></td>
<td>1</td>
<td>N/A</td>
<td>1.6</td>
</tr>
<tr>
<td>JK-Grade 6</td>
<td></td>
<td>3</td>
<td>N/A</td>
<td>5.0%</td>
</tr>
<tr>
<td>JK-Grade 8</td>
<td></td>
<td>42</td>
<td>N/A</td>
<td>70.5%</td>
</tr>
<tr>
<td>JK-Grade 12</td>
<td></td>
<td>1</td>
<td>N/A</td>
<td>1.6%</td>
</tr>
<tr>
<td>Grade 7-12</td>
<td></td>
<td>1</td>
<td>N/A</td>
<td>1.6%</td>
</tr>
<tr>
<td>Grade 7-8</td>
<td></td>
<td>2</td>
<td>N/A</td>
<td>3.3%</td>
</tr>
<tr>
<td>Grade 9-12</td>
<td></td>
<td>10</td>
<td>N/A</td>
<td>16.4%</td>
</tr>
<tr>
<td>Type of School</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Catholic</td>
<td></td>
<td>36</td>
<td>24</td>
<td>39%</td>
</tr>
<tr>
<td>Public</td>
<td></td>
<td>61</td>
<td>36</td>
<td>61%</td>
</tr>
<tr>
<td>Elementary</td>
<td></td>
<td>81</td>
<td>51</td>
<td>84%</td>
</tr>
<tr>
<td>Secondary</td>
<td></td>
<td>16</td>
<td>10</td>
<td>16%</td>
</tr>
</tbody>
</table>
Table 4

*Free Text Responses to Administrator Survey*

<table>
<thead>
<tr>
<th>Question</th>
<th>Categories</th>
<th>Subcategories &amp; Codes</th>
<th>Total/Key Words or Phrases</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. At your school, which of the following are used to identify students with asthma? e=other</td>
<td>Identification Process</td>
<td>Forms</td>
<td>n=17</td>
<td>“Registration forms” 6 (35%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“Data verification sheet” 3 (18%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“Medical form” 2 (11%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“Medical peril form” 1 (0.6%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“Trillium record” 1 (0.6%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“Note in student file” 1 (0.6%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“For those using puffers” 1 (0.6%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“Student information form” 1 (0.6%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“Elementary School Database” 1 (0.6%)</td>
</tr>
</tbody>
</table>

*Note: Responses do not equal n of 17 as some respondents provided more than one comment for this question.*
Table 5

*Ontario Summary of School Administrators*

<table>
<thead>
<tr>
<th>Type of School</th>
<th>Total Number</th>
<th>Administrator Gender</th>
<th>% Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary</td>
<td>5315.39</td>
<td>Female</td>
<td>64.9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>35.1%</td>
</tr>
<tr>
<td>Secondary</td>
<td>2096.05</td>
<td>Female</td>
<td>48.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>51.5%</td>
</tr>
<tr>
<td>Elementary &amp; Secondary</td>
<td>7411.44</td>
<td>Female</td>
<td>60.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>39.7%</td>
</tr>
</tbody>
</table>

Table 6

*Number of Full-time Equivalent (FTE) Principals and Vice-Principals by age group in 2010-2011 (Ministry of Education, 2011).*

<table>
<thead>
<tr>
<th>Academic Year 2010-2011</th>
<th>Age Group</th>
<th>FTE Educators</th>
<th>% age</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25 years</td>
<td>&lt;10</td>
<td>0.12%</td>
<td></td>
</tr>
<tr>
<td>25-29 years</td>
<td>&lt;10</td>
<td>0.12%</td>
<td></td>
</tr>
<tr>
<td>30-39 years</td>
<td>968.55</td>
<td>13.07%</td>
<td></td>
</tr>
<tr>
<td>40-49 years</td>
<td>3263.48</td>
<td>44.03%</td>
<td></td>
</tr>
<tr>
<td>50-59 years</td>
<td>2741.28</td>
<td>36.98%</td>
<td></td>
</tr>
<tr>
<td>60+ years</td>
<td>434.63</td>
<td>5.86%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>7411.44</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Source of FTE Data: As reported by schools in the Ontario School Information System (OnSIS), 2010-2011
Figure 3. Knowledge to Action Framework Phase Two

Figure 3. Taken from “Lost in Knowledge Translation: Time for a Map?” by Graham, Logan, Harrison et al., 2006, Journal of Continuing Education in the Health Professions, 26, p. 19.
Abstract

Purpose: To present, discuss, and validate survey results with school administrators. Seeking to understand administrators’ experiences regarding facilitating factors, barriers and to discuss strategies for optimal asthma management within the school setting. Administrators’ meeting objectives included: 1) present, review, and discuss survey results, 2) identify important facilitating factors and barriers, 3) provide empirical support for planning, and 4) build momentum and enthusiasm among administrators by emphasizing the direct benefits of optimal management (decrease absenteeism & increased academic performance with minimal disruption to class time).

Method: Two administrators participated in a 1.25-hour meeting. Study results were presented and discussed. The meeting was audiotaped; and professionally transcribed. Due to small sample size, data was narratively reported.

Results: Barriers reported included difficulty-identifying students with asthma and the need for standardization and tightening up policy and procedures at the individual school and board level. Experiences with school asthma management were nominal given that asthma was not thought as severe compared to anaphylaxis. Administrators were not familiar with or aware of the free resources available from the Ministry of Health and Long Term Care’s (MOHLTC) Asthma Plan of Action (APA) initiative the Public Health Asthma Friendly School Program.

Conclusion: Meeting participants confirmed survey results. While there is a lack of standard process and procedure for asthma management within schools, participants were interested in partnering and moving forward to ensure their district school board and individual schools are ‘asthma friendly’.
Chapter 4

What is the Key Stakeholders’ Response?

Given that surveys do not provide rich narrative, phase three of this study included an administrator meeting. The original intent of the study’s phase three was to complete a town hall however, given the limited attendance, the town hall is referred to as the administrators’ meeting. Understanding administrators’ perspective assists in decision-making related to asthma management and development of supportive school policy (Horne-Warren, 2007). Further, engaging, collaborating, and establishing partnerships with administrators via meeting are essential steps for practice change. This chapter will provide an overview of the administrators’ meeting. Results are further broken down under the headings of barriers and experiences voiced by school administrators. In addition, limitations and implications for nursing practice will be reviewed.

Research Questions

The primary research question was: “What additional barriers or facilitators do administrators report for asthma management within the school setting?” Secondary research question included, “What are the administrator attitudes and experiences regarding asthma management within the school?”

Study Design

In order to answer the research questions posed above, a meeting was scheduled with a purposeful sample of school administrators. The meeting is also referred to as the key informants’ meeting and was grounded in the Knowledge to Action Framework (Figure 1). This phase continued to Assess Barriers to Knowledge Use (survey results,
administrators’ experiences/attitudes regarding asthma management) and Select, Tailor, Implement Interventions (set goals for asthma management within the school setting and discuss strategic vision and plan, development of policy). Working within the KTA framework, the key informant interview sought to involve, support, and build momentum with key players (administrators & researcher). These were crucial steps to ensure empirical support for research-practice partnership and overall study’s success (Harrison & Graham, 2012).

**Population, Sample, and Recruitment**

An inclusion criterion for study enrollment was that subjects needed to be administrators of English–speaking schools within the two Boards of interest. All 97 administrators were invited to participate. Those interested were asked to self-identify, via the final survey question that stated; “I am interested in participating in a ‘town hall’ upon study completion.” The purpose was explained as “To review and discuss study results along with future strategies for optimal asthma management within the school setting.” Self-identified administrators were contacted by phone and a mutually agreed upon a meeting date. Reminder calls were completed prior to the meeting to ensure maximum attendance. Main objectives for the meeting were to 1) present, review, and discuss survey results, 2) identify important facilitating factors and barriers, 3) provide empirical support for planning, and 4) build momentum and enthusiasm among administrators by emphasizing the direct benefits of optimal management (decrease absenteeism & increased academic performance with minimal disruption to class time (Harrison & Graham, 2012). Given n=2, the objectives were ambitious.
Method

Prior to commencement of data collection, consents were distributed for participants to review and sign (Appendix H) with the researcher acting as consent witness. Once this was completed, it was explained that the meeting would be audiotaped, transcribed verbatim, and that all information would be entered in a data program on a password-protected computer. Data would be analyzed and presented as group data, with no discussion that would identify any individual, work setting, or employer. As such participants were made aware that that the audio recorder be turned off at any point at their request. In addition to the researcher, an observer was present but did not actively participate in discussion. Using field notes, the observer provided detailed account about participants’ non-verbal behavior and emotional response (Polit & Beck, 2012). As there were no questions posed by administrators, the meeting began.

Guided by the study topic (asthma management in school), a presentation and semi-structured format were undertaken. The meeting design allowed for presentation, review, and discussion regarding survey results, identifying and clarification of results, exchange of information, and through group discussion productive solutions for asthma management were contemplated (Johnson, Blanchard, & Harvey, 2000). Clarifying survey results with participants added to study validity (Hsieh & Shannon, 2005). In addition, linking survey results back to the data assured study reliability (Polit & Beck, 2012). Creating enthusiasm among participants was accomplished by drawing a link between school health research and tangible benefits (decrease absenteeism & increased academic performance) for creating asthma friendly schools (Befort et al., 2008; Harrison & Graham, 2012). The meeting was 1.25 hours in length.
Data Analysis

In terms of analysis process for the semi-structured meeting, inductive content analysis was originally chosen because there is so little known about administrators’ experience with asthma management (Elo & Kyngas, 2007). The primary purpose of this method was to capture experiences of administrators yielding rich narrative data and generate new insights that would help shape application of evidence into practice (Schreier, 2012). However, given the small sample size, data was limited lacking richness typical of qualitative methods. Out of respect for participants’ time and effort, data was reported as narrative.

Administrators’ meeting data was transcribed verbatim. Transcription and observer’s notes were read through several times. The observer’s detailed notes provided information regarding significant nonverbal behavior, emotional content, and are included in the results discussion.

Results

Demographic Data

Out of the 97 administrators invited, four expressed an interest in participating as indicated on the administrator survey. This represents only 4% of the total study participants eligible. While contacting those interested, one administrator declined due to workload and another cancelled last minute for personal reasons. In the end, only two administrators attended the administrators’ meeting one from each district school board. Given there were only two participants, demographics will not be discussed further in order to protect anonymity of participants.

As previously stated in order to answer the research questions posed for phase
three, results will be explored under the following headings: 1) Additional barriers; 2) administrators’ experiences; and 3) attitudes asthma management within the school setting.

**Additional Barriers**

**Difficulty in identifying students with asthma.** On the survey, the most common reported way of identifying a student with asthma was either a medicine form or a parent note. Meeting administrators confirmed these results and noted there is no consistent identification process. Observer transcript documented the nodding of heads in agreement with survey response. In addition, administrators discussed the difficulty they had locating numbers of students with asthma in their respective schools. “Like I had to really hunt to figure out how many kids I had in the schools that had asthma.” Searching for students with asthma was a surprising exercise for one administrator. “…I was surprised at the numbers on the list. “It was kind of like oh, I didn’t know about her, so it was a little surprising even for me.”

**Lack of standard process.** This topic led directly into discussion regarding desire for standardized process and tools. “You know, the best information we seem to have is whether somebody has a puffer or not.” Searching the medical category on student’s record database identified children in a more “official way”. However, there was agreement that the identification process needed addressing, “.this is seeming like we could tighten it up for sure.” Administrators were asked to share their thoughts on reasons for difficulty in this area. The following barriers were identified; parents minimizing disease severity, forms not being returned, difficulty obtaining ‘official doctor diagnosis’ in younger children, and the fee physicians charge for completing
forms.

“Even in terms of any type of medical documentation that comes back from a doctor’s office, we often don’t get that and I am not sure if it is because, sometime with those forms we ask them to be renewed each year. And I believe the doctors will charge a fee to actually fill those out so I think that may be an issue for some families and maybe they are just thinking well, you know, I won’t submit it or I’ll put it down but there’s nothing to say from a doctor that the child actually has it so, you know in terms of identification I am not sure.”

**Communication.** Communication between parent and school staff was listed as a significant barrier on the administrator survey. Observer notes that while both administrators were in agreement; heads nodding one administrator reacted strongly to this barrier stating, “Hmmm, hmmm, yeah, that’s it”. Administrators had never met with or had formal meeting request from parents to discuss asthma management at an individual or policy level. The identification of students with asthma was a substantial barrier for asthma management in schools. In addition, administrators spoke to their experiences regarding asthma actions plans, seeking information, responding to a severe asthma episode, and working within an organizational structure. The Public Health Asthma Friendly School Pilot Project was also discussed.

**Experiences**

**Asthma action plans.** Given that close to 30 % of students did not have a written asthma action plan (AAP) on file, participants were invited to share their experiences with asthma management plans. Asthma plans had different meanings to each administrator. One administrator stated, “For us that’s what I’ve actually created the sheet and it basically just says in the event someone has an asthma attack this is what to do.” Observer noted the AAP discussion particularly resonated with an administrator due to personal experience. Despite, the familiarity with the AAP, there were no physician
approved plans on file nor were plans made available by either district school board. “I
have never seen that come in in a kid’s medical file, ever.” Interestingly, no parent had
ever requested a school meeting to discuss his or her child’s asthma or the written AAP.
Both administrators were interested incorporating plans in the school. “I would like to
see that certainly happen in the staff room with the kids’ pictures and the information that
we need and I would like to see the Sabrina’s law sign off.”

Seeking information. Both administrators had never heard of the Regional
General Hospital’s Asthma Education Centre and agreed that if asthma information was
needed the local Public Health Unit or Ontario Physical Health Education Association
(Ophea) would be chosen. “I think that it (health unit) is the one that is the most
automatic for teachers. That’s the one they know the best.” Ophea was known as it
relates to the physical education curriculum. Interestingly, neither participant had sought
out asthma information in the past year.

Physical education. Administrators scored high on survey questions regarding
ensuring access to safe, enjoyable physical education and activity opportunities for
children with asthma as well as allowing access to medication before physical activity
when needed. As discussed in the previous chapter, this was contrary to research
findings. Meeting participants were asked to share their experiences regarding activity.
One administrator reported her shock, “If you’re not breathing properly you know when
you need to use your inhaler. It just doesn’t make sense to me to lock it up in the
office….” High scores within the two district school boards was thought to be related to
physical education as part of the curriculum, mandated daily physical activity (DPA), and
overall increased physical activity on a regular basis in school.
First aid. First aid training was not mandatory for all staff and both boards require ten % of school staff are trained and in the building at all times. There was no monetary incentive for teachers to complete voluntary training besides “peace of mind”. First aid training is tied to positions for Educational Assistants (EA) however this is not the case for teachers. In one district school board maintaining annual standards falls to the Health and Safety Committee. One administrator reported “I can’t say there is any really formal mechanism for it.” The administrator was responsible for putting training in place when required. This topic led into discussion regarding working within organizational structure.

Organizational structure. Each administrator had unique experiences working within the organizational structure. “Getting the information back to principals” through board and committee was seen as important for uptake of policy and optimal practice. As reported by the participants, medical forms are board specific and the process involves numerous steps. Forms are sent home with students every fall or upon enrolment for parents or caregivers to complete. Once completed, the forms are sent back to the teacher, who sends them to the office, and then the administrative assistant (AA) enters the data. A “severe” health issue would trigger the AA to create school specific sheets for posting. These sheets may vary between schools and boards and may not be evidenced based. Other than the AA, by administrators’ reports there is no individual policing forms or following up with the families. Current structure is passive, school specific, and onus is on the AA to decide what is severe. Administrators reported that policies are set by the board but “periodically checks” are completed to ensure practice aligns with policy. There was no timeframe for “periodical”. Administrators discussed
the need to “tighten up” policies and procedures.

**Public health asthma friendly schools pilot project.** The MOHLTC’s Asthma Plan of Action strategy was established in 2002. One of these initiatives presented was the Public Health Asthma School Pilot Project (PHASPP) that was implemented in five Ontario district school boards near the Toronto area. The project included implementation of an 'in house' six week evaluated asthma education program for grades three to five called the Roaring Adventures of Puff (RAP), an Asthma Friendly Schools Resource Kit to support school staff in optimizing asthma management in schools, a child and youth public education project, and an *Asthma in Schools* website endorsed by MOHLTC, Ontario Lung Association (OLA), Ophea, and public health units. Based on pilot successful results, the APA pilot school initiative received funding to continue as a permanent program in four of the five original sites. Recognizing the tremendous benefits of this program and fiscal limitations, the Ministry of Health and Long-Term Care created a "Train the Trainer program" in order to assist in disseminating the program across the province (Cicutto et al., 2006). Asthma Friendly School resource binders were distributed to all public schools in 2006 and the pilot is now a program in four sites. The binder contains emergency management posters (Appendix N), school based student management plans (Appendix M), parent information packages, and educational in-service materials.

Interesting to note, newly appointed administrators at the time of the program, participants had never heard of the initiative, project, or resource binder. “I have never seen that binder.” Administrators were extremely interested in these free deliverables. “It would certainly be a great resource, all of these resources.” Observer noted
administrators made eye contact, sat up in their chairs, and voices were animated. “But having something that is standardized and maybe an electronic version of that template (School Management Plan Appendix M) so that I can just bring it up, pop in the child’s name and then go through it would be great as well.”

“Asthma Friendly Schools” was not a familiar term to the administrators however, both inquired what would a school need to do in order to fit the criteria. Efforts were made to identify children with asthma, reduce environmental triggers, maintain annual first aid training, medication policies for self-carry and administration within the schools under participants charge. All of these are in keeping with components of an asthma friendly school.

**Attitudes**

**Responsible.** According to the survey responses, half of administrators stated they alone were responsible for implementing school policy permitting students to carry and self-administer asthma medications. The observer noted participants appeared surprised by this finding and one administrator crossed arms and sat upright. “They (principals) would ultimately be responsible for students and their care so, I’m not sure where the other percentages would have come from.” Both administrators agreed that while the board sets the policy, enforcement of policy is the administrator responsible alone. According to administrator reports, official evaluation process varied between district school boards. Interesting to note, the role of administrator, as protector was important to one principal. “I don’t want anybody getting ill on my watch.”

**Student advocate.** Similar to the concept of protect, one administrator stated that students regardless of age are the “best judge of their asthma”. Advocating that
medication be kept on the child was important. Practice of locking up medication in the office was not well received. “That is not something I would want to happen. It just doesn’t make sense to me.” In addition, administrators were engaged throughout the meeting discussion and expressed their desire to “be informed” and “assist” in the process for “our schools and board” to support optimal asthma management. Both offered to act as champions during the “next steps”.

Prevalence. While initially administrators felt that they accurately recognized prevalence of asthma and for one administrator this was the impetus for study involvement. “It’s (asthma) very prevalent in our schools and it’s something that I want to be informed of...” School administrators were surprised when the provincial prevalence rate for childhood asthma was reported. Observer notes documented that both administrators paused and took note of numbers of children with asthma. Participants identified 26 students with asthma between their two schools. However, given the reported provincial prevalence, the total should equate 51 students. One administrator stated, “We were way off”. When asked about reasons for this, administrators felt this may be due to minimizing asthma “it’s not really on our radar” and that parents are not readily identifying children to the school thinking that it is not a “super serious thing”.

Disease severity. Administrators stated that they felt the potential seriousness of asthma was minimized. “You know, looking at how serious that (asthma) can be I think we underestimate that in the schools.” Administrators also felt that parents minimize asthma. “..and the asthma they (parents) tend to think it ‘Oh well, it might be a flare, he might have to sit out from phys-ed, or might have to sit on the bench at recess or whatever,’ but I do not think they are seeing it (asthma) as such a big risk.”
Administrator themselves tended to minimize asthma, “I tend to think that anaphylaxis is so much more severe and so much more you know life threatening and not necessarily the case, right?” The semi structure of the administrators’ meeting allowed for discussion comparing asthma and anaphylaxis management (Sabrina’s Law) within school setting.

**Anaphylaxis, asthma, and safety.** Sabrina's Law requires Ontario public district school boards to establish an anaphylaxis policy that includes reducing allergen exposure, provide regular anaphylaxis management training for school personal, and establishing individual anaphylaxis emergency management plan (Cicutto et al, 2012).

Administrators agreed that anaphylaxis management in the Ontario School setting is established and well recognized. They were asked to share their thoughts regarding the differences between anaphylaxis and asthma. “There is a focus on Sabrina’s Law as one of the things that we need to go over now (first PD day).” There was a process in place to ensure administrators adhered to this, “we actually have to check off that we have actually done it.” The process had evolved for another administrator from hands on training to kit, to electronic “almost like a slide show” but this was “not so much part of my staff meeting at the beginning of the year anymore.” Both administrators were familiar with the Student Anaphylaxis Emergency Plan forms (Appendix I). Placing individualized emergency plans in several locations such as school office, child’s class, and staff lunch room assisted in staff awareness. According to participants’ experiences parents of children with anaphylaxis are quick to identify their child however; parents of children with asthma may be less apt to notify the school, as they do not see asthma as a “big risk”. Overall, the perception that anaphylaxis is fatal but asthma is not may influence differences in awareness and management.
Discussion

Meeting participants were surprised regarding asthma prevalence and according to provincial statistics; students with asthma were underestimated in both schools. One participant went to great lengths to secure accurate count. This difference in results generated additional research queries namely, “Is asthma prevalence within schools underestimated or are parents choosing not reporting it?” In addition, is the lack of reporting related to 1) parents not understanding the severities of asthma or 2) trying to bypass school policies or 3) diagnosis is not confirmed.

Anecdotal reports from the researcher’s clinical practice indicate that parents do not feel supported and that asthma is not optimally managed within the school setting. Looking to the literature, fathers in a phenomenological study reported concern about their children’s safekeeping at school primary related to the school asthma medication policies (Cashin, Small, & Solberg, 2008). When attempts to address this issue were refuted, fathers instructed their children to secretly disregard the rules (Cashin, Small, & Solberg, 2008). Parents in other studies reported suboptimal collaboration with school staff when they attempted to address asthma management concerns (Barrett, Gallien, Dunkin, & Ryan, 2001; Buford, 2004; Dalheim Englund, Ryderstrom, & Norberg, 2001; Horner, 1997; Meng & McConnell, 2002). A quantitative United Kingdom study found that prevalence rates declined once children turned 7 years and older. The reason why was that once a child could self-administer, parents did not report asthma diagnosis to the school for fear the medication would be restricted or puffer confiscated (McCann et al., 2002). Formal exploration of parents’ practices in terms of identifying their child to the schools should be considered for this Ontario region.
Strengths

This administrators’ meeting was innovative given that it is the first of its kind among previous published literature. By grounding it within the Knowledge to Action framework, exploring barriers and experiences voiced by school administrators were possible. Checking survey results with administrators not only added to the validity but also provided opportunity for detailed discussion. The meeting also provided a venue for researcher and administrators to discuss evidence based resources and implementation strategies. The meeting engaged administrators in creative solution by better understanding their experiences. In addition, awareness regarding available resources was accomplished.

Limitations

Despite the study information letter (Appendix E) highlighting better academic performance, decrease school absenteeism, and improved safety as direct benefits for study participation, attendance was suboptimal. In future, consideration should be given to include a mail out invitation to all eligible participants regardless of cited interest upon survey completion. The research protocol, allowed for only those administrators who self-identified to be contacted directly. In the end, only two percent of eligible administrators were present. Lack of engagement may be related to date of administrators’ meeting. Principals in one qualitative study indicated that the time of year has a significant impact on whether research projects would be approved and that spring semester was a difficult time (Befort et al., 2008). In addition, a provincial dispute between teachers’ union and government regarding contract renegotiations was finalized among public schools just two weeks prior to the administrators’ meeting. The
participants expressed that minimizing severity and prevalence of asthma may be additional factors affecting administrators’ meeting participation. Anaphylaxis training and management was viewed as priority and asthma was seen as benign.

Using an administrators’ meeting is an effective forum for detecting issues and exchanging information (Johnson, Blanchard, & Harvey, 2000). There is however, debate on the ideal number of participants. Some experts’ recommend 8 to 12 participants and others cite minimum (Pal, 2012). A smaller group (less than six) may not facilitate proper discussion to generate reliable sufficient data (Zuckerman-Parker & Shank, 2008). With only two participants for the administrators’ meeting, a significant limitation of the study was the small group size. This affected the richness of the data. Social desirability and recall bias are also potential limitations. Given that there was no anonymity, administrators may have been more reserved not participating fully in discussion regarding their current practices, experiences, and attitudes regarding asthma management within the schools.

**Practice Implications**

In spite of the small number of participants, the meeting highlighted the urgent need to address the issue of asthma management within the schools to ensure that children are safe. In September 2013, the OLA disseminated an Asthma Friendly Resource DVD to all public school administrators within the province. In keeping with the KTA framework, meeting with district school boards to review study results and discuss implementing DVD resources within schools will support moving evidence into practice. Requests to attend monthly principal meetings along with speaking to teachers at the professional development (PD) days are one way to ensure uptake.
Policy Implications

In addition, creating policy at the board level for all schools will assist in uptake of current resources and support students with asthma. Support would be accomplished by a well-defined identification process, provision of action plan, medical arrangement, and regular staff training for recognizing and responding to asthma (McCann et al., 2002). Policy would encourage open communication between parent and school staff, awareness about child’s asthma management plan, triggers, medication, school absenteeism, fatigue, and possible learning difficulties associated with uncontrolled asthma (McCann et al., 2002). Evaluation of reported practices will be required in future to sustain change. With only ten percent of school staff currently required to have basic first aid training, deficiencies in identification, lack of standardized children’s action plans, students with asthma are at high risk for injury and death.

Conclusion

The ultimate goal of this study was to ensure safety and minimize risk for children with asthma within the public school setting. As administrators are seen as the gatekeeper of school programs and procedures (Horne-Warren, 2007) and as they are not always aware of available resources (Cicutto et al., 2006), it was critical to engage them in the stakeholders meeting. The researcher was then better able to address and understanding their perspectives and experiences with asthma management and how these may influence asthma management practices. Barriers placing students at jeopardy for injury or death (lack of standard process & procedure for asthma management) were identified. In addition, empirical support for planning was discussed. Administrator participants were engaged in the process. They want help to address this issue, are
interested to move forward with implementation and planning to make schools ‘asthma 
friendly’.
References


Figure 4. Knowledge to Action Framework Phase Three

Figure 4. Taken from “Lost in Knowledge Translation: Time for a Map?” by Graham, Logan, Harrison et al., 2006, *Journal of Continuing Education in the Health Professions*, 26, p. 19.
Chapter 5

Discussion

This ultimate goal of this mixed method study was to ensure the safety and minimize risk for children with asthma within the public school setting. The impetuous for this study came from the stories shared by parents in the researcher’s professional practice as a paediatric asthma educator. One of their biggest concerns was the issue of asthma management within the school context. This study was the first to examine asthma school management practices within English speaking for this Ontario Region. Reflecting over the planning, implementation, and evaluation of the multi-phased eight-month study, it is hoped that momentum will drive this issue forward assuring the study’s goal a safe and supportive environment for children with asthma. The purpose of this chapter is to provide discussion regarding study results within the conceptual Knowledge to Action framework. Considerations for moving forward, practice, and policy implications are reviewed. Finally, future research questions for are considered.

Conceptual Framework

The Knowledge to Action framework provided a relevant structure for assessing asthma management practices within the public school setting and was used for each of the three study phases as phased action approach. This methodology involved exploring the larger knowledge base in a systematic endeavor (highlights knowledge inquiry, synthesis, product tools on the KTA), followed by a needs assessment of local experience (highlight issue/problem clarification on KTA), and finally what opportunity was there to improve the situation (barriers/facilitators, ideas to tailor intervention on the KTA).

To further elaborate, using the KTA framework, phase one integrative
comprehensive synthesis of the evidence; focused on *Knowledge Inquiry* and *Knowledge Synthesis* by examining the issue, extent of the problem, and evidence for asthma management within the school context. This allowed a better understanding of theoretical and empirical evidence of asthma management within the school setting as well as local and regional contextual issues.

**Considerations for Moving Forward**

Established in 1998, World Asthma Day (WAD) is an annual event to raise asthma awareness and improve management of the disease (Global Initiatives for Asthma, no date). The 2012 death of an Ontario boy has created a sense of urgency to address asthma management practices within the school setting. It is no surprise that the focus of WAD was asthma control in schools. Provincial events scheduled include a “Call to action: Need to create asthma friendly environments in schools” media release (Appendix J), principal school package mail out that includes joint letter from the Ontario Lung Association (OLA) and Ontario Physical Health and Education Association (Ophea) (Appendix K), Asthma Friendly School Booklet (Appendix L), Asthma in Schools pamphlet, and Student Asthma Management Plan (Appendix M), along with a press release of “Ryan’s Story” video.

The timing of the WAD awareness campaign was serendipitous. Having just finished the final phase of the thesis project, consideration was given for next step to address asthma management within the two public district school boards. A condition for study approval within both Boards was a follow up meeting for dissemination of study results. A meeting will facilitate discussion regarding implementing available and evidence-based resources and strategic plan (*Monitor Knowledge Use, Evaluate*
Outcomes, Sustain Knowledge Use). With packages mailed to all provincial administrators, dissemination of evidence-based “Asthma Friendly Schools” resources will be facilitated; the next step of the Knowledge To Action framework Select, Tailor, Implement Intervention. However, dissemination of resources does not equate behavior change and KTA is needed to move the issue forward.

Practice Implication

Combinations of interventions are more effective than passive educational sessions in terms of behavior change (MacDermid & Graham, 2009). Interactive partnerships are needed in order to facilitate research into practice (Shea et al, 2005 Consumer article). This has implications for the administrators’ provincial mail out. Canadian research found that even with school based anaphylaxis legislation in place school staff and parents had little knowledge regarding their own local district school boards’ written policies and procedures (Cicutto et al., 2012). All groups including school staff, health care providers, community health nurses, parents, and students need to be involved and invested in the process for knowledge (“asthma friendly” schools) to become a reality (Draper et al, 2009). In addition, a variety of formats to effect change are needed for successful change in practice (Kitson, 2009).

There is a strong need to build capacity within schools to address management of childhood asthma in Ontario. The dissemination of an asthma friendly resource DVD to all public school administrators is an important first step (Ophea, 2013) and should be endorsed and supported by public school boards. Notifying parents of these changes in practice can be accomplished via school newsletter parent counsel meetings, public health unit, or via asthma practitioner. This will assist in addressing the lack of standard
identification process and communication barriers identified in the study.

Involving public health nurses to implement school based asthma education for staff and students can be done. In the Ontario Public Health School Asthma Pilot Project, fifty hours of public health nurses’ time (per school) ensured schools were asthma-friendly within a one-year period (Cicutto et al., 2006). The pilot program addressed staff education standards, curriculum supplements, regulations, and awareness activities (D'Cunha, 2000; Centre for Disease Control and Prevention, 1997). A similar evaluated asthma school initiative in Australia was successfully incorporated into the education curriculum and was sustainable five years after later with minimal nursing intervention resulting in multiple cost savings (Henry et al., 2004). This might also be a viable option once the program is up and running.

As an additional incentive, the Ontario Ministry of Education promotes a school recognition program called “Healthy Schools”. Components include quality instruction and programs, a healthy physical environment, a supportive social environment, and community partnerships. Components incorporate each of the following topics: Personal safety/injury program, physical activity, healthy eating, mental health, bullying prevention, substance abuse, healthy growth and development and other (Ontario Ministry of Education, 2011). All publically funded schools are eligible and participants can highlight programs or activities they are engaging in to make their school “healthy”. There is a formal submission process and activities/programs are connected to the Foundations for Healthy Schools. For the 2011-2012, there were 36 schools within the study’s two schools boards that participated. More than 90 % focused on physical activity and this may account for the high survey reports with physical activity. Schools
that are approved and active in the program, receive a certificate from the Premiere, Ministries of Education and Health and Long Term Care. They are also recognized on the Ministry of Education website. Implementation of an asthma friendly school would fit under this program and provide an additional incentive.

The “Healthy Schools” initiative recognized the importance of partnership and this is a critical aspect of the KTA framework for “service delivery” and the as key stakeholders move forward with actions to reduce risk for students with asthma. The next steps should include planning, implementation, and evaluation phase for the development of policy process (Pal, 2010). Partnering with health care experts such as public health nurses, local asthma educators, the Ontario Lung Association, and Ophea would assist the promotion of healthy school environments and disease management for those students living with asthma (Henry et al., 2004).

Also discussed in Chapter two is the relatively new initiative of School Based Health Clinics (SBHC) with the first Ontario pilot underway in Toronto. Pending the evaluation results of the SBHC, this initiative may provide yet an additional stately when funded to effectively manage childhood asthma.

**Policy Implications**

School administrators have a legal responsibility to protect children and provide a safe and supportive school environment (Cicutto et al., 2006). Study findings identified lack of standard identification process, insufficient staff training, suboptimal communication, and lack of school policy placing children with asthma at risk. Gathering of stakeholders to discuss a board strategy for uptake of “asthma friendly” resources and supportive asthma policy are needed. There is an urgent need to shift into
a preventative framework not a reactive one with supportive, effective legislation. A governing body should be appointed to monitor adherence and implementation of legislation and school based programs because without proper support to implement laws, change in practice will not occur (Cicutto et al., 2012).

**Implications for Future Research**

Meta analysis was only available for school-based educational interventions. A systematic review of all components of asthma friendly school should be an area of future study. This would further strengthen support for implementing policy and programs within this Ontario region.

One of the challenges of the study was to find a needs assessment tool in order to ensure scientific rigor. An extensive search for a reliable and valid tool failed. In the end, the Center for Disease Control and Prevention survey tool was used. The tool was adapted to make content more Canadian Friendly and addressed the majority the full aspects of an asthma friendly school. Validating this tool should be considered and would add to the strength of future studies.

There is little research focusing solely on school administrators. Further qualitative exploration of this target populations feelings, attitudes, and beliefs regarding asthma should be considered. Given the provincial dissemination of school resources scheduled for September 2013, completing a second survey study to assess change in practice would be important.

**Conclusion**

The school setting is one of the most important venues for asthma management (Snow et al., 2005). Study results and the death of a young Ontario boy highlight that
children with asthma are at risk. Effective management of asthma must occur in an environment that is supportive, encouraged and established through community partnership and healthy public policy. Schools cannot be expected to solve health issues alone. An asthma friendly school policy is a creative solution for school systems to become part of children's health services (Crickmore Farrior, Keehner Engelke, Shoup Collins, & Gordon Cox, 2000).
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Figure 1. Knowledge to Action Framework

*Figure 1.* Taken from “Lost in Knowledge Translation: Time for a Map?” by Graham, Logan, Harrison et al., 2006, *Journal of Continuing Education in the Health Professions*, 26, p. 19.
Appendix A

QUEEN'S UNIVERSITY HEALTH SCIENCES & AFFILIATED TEACHING HOSPITALS RESEARCH ETHICS BOARD-DELEGATED REVIEW

November 19, 2012

Ms. Nicola Thomas
School of Nursing
Queen’s University

Dear Ms. Thomas

Study Title: NURS-293-12 A Practice Audit, Barrier Assessment, and Gap Analysis of Current Asthma Management Practices in English Speaking Public Schools in One Ontario Region.

File # 6007515

Co-Investigators: Dr. K. Sears, Dr. M. Harrison, Dr. J. Almost

I am writing to acknowledge receipt of your recent ethics submission. We have examined the protocol, script and protocol for self-administered principal questionnaire, principal questionnaire, principal demographic questionnaire, school boards of interest for the study list, revised information letter and town hall information/consent form for your project (as stated above) and consider it to be ethically acceptable. This approval is valid for one year from the date of the Chair’s signature below. This approval will be reported to the Research Ethics Board. Please attend carefully to the following listing of ethics requirements you must fulfill over the course of your study:

Reporting of Amendments: If there are any changes to your study (e.g. consent, protocol, study procedures, etc.), you must submit an amendment to the Research Ethics Board for approval. Please use event form: HSREB Multi-Use Amendment/Full Board Renewal Form associated with your post review file # 6007515 in your Researcher Portal (https://eservices.queensu.ca/romeo_researcher)

Reporting of Serious Adverse Events: Any unexpected serious adverse event occurring locally must be reported within 2 working days or earlier if required by the study sponsor. All other serious adverse events must be reported within 15 days after becoming aware of the information. Serious Adverse Event forms are located with your post-review file 6007515 in your Researcher Portal (https://eservices.queensu.ca/romeo_researcher)

Reporting of Complaints: Any complaints made by participants or persons acting on behalf of participants must be reported to the Research Ethics Board within 7 days of becoming aware of the complaint. Note: All documents supplied to participants must have the contact information for the Research Ethics Board.

Annual Renewal: Prior to the expiration of your approval (which is one year from the date of the Chair’s signature below), you will be reminded to submit your renewal form along with any new changes or amendments you wish to make to your study. If there have been no major changes to your protocol, your approval may be renewed for another year.

Yours sincerely,

Chair, Research Ethics Board

November 19, 2012

Investigators please note that if your trial is registered by the sponsor, you must take responsibility to ensure that the registration information is accurate and complete
December 10, 2012

Ms. Nicola Thomas
53 Florence Street
Kingston, Ontario
K7M 1Y5

Dear Ms. Thomas:

This letter will acknowledge receipt of your research proposal entitled, “A Practice Audit, Barrier Assessment, and Gap Analysis of Current Asthma Management Practices in English Speaking Public Schools in One Ontario Region.”

You have submitted the following components required as part of the Limestone District School Board Administrative Procedure regarding External Research;

- written commitment to ensure anonymity of Board, schools, staff and students
- abstract of the research proposal
- copies of questionnaires, schedules
- principal consent form
- official ethics review

May I emphasize that it is understood that for all research projects, the name of the District School Board, the name of the school, participants, teachers and students would not be identified in your final report and participants would have a right to opt out of this project at any time.

Approval is granted for you to contact Principals within the Board. Following the completion of your project, a copy of your report is required to be submitted to the Limestone District School Board.

Sincerely,

Barb Fraser-Stiff
Superintendent

cc: Principals
    Senior Staff

Helen Chadwick - Chair | Brenda Hunter - Director of Education and Secretary | Roger H. Richard – Treasurer

Our Students, Our Future
Appendix C

ALGONQUIN AND LAKESHORE CATHOLIC DISTRICT SCHOOL BOARD

Office of the Superintendent of School Effectiveness

January 28, 2013

Ms. Nicola Thomas
53 Florence Street
Kingston, Ontario
K7M 1Y5

Dear Ms. Thomas:

Thank you for your interest in having the Algonquin and Lakeshore Catholic District School Board participate in "A Practice Audit Barrier Assessment, and Gap Analysis at Current Asthma Management Practices in English Speaking Public Schools in One Ontario Region". We have reviewed your request for participation in the research and are pleased to inform you that your proposal meets the criteria for conducting research in Algonquin and Lakeshore Catholic District School Board.

You have been approved to begin your research in the school years 2012-2013. Each school principal that you have chosen will be encouraged to participate in the research project; participation will be at their discretion.

I wish you every success with your research. We look forward to receiving the results of your study. Please feel free to contact me with any questions that you might have.

Sincerely,

Erin Walker
Assistant to the Director of Education

TS/mag

cc: J. DiRocco, Director of Education
    T. Kennedy, Superintendent of School Effectiveness
    K. Shannon, Superintendent of School Effectiveness
    T. Slack, Superintendent of School Effectiveness

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Appendix D

Script and Protocol for Self-Administered Principal Questionnaire

Introduction

“Good morning. My name is Nicola Thomas and I am a graduate student in the School of Nursing at Queen’s University. I would first like to thank the School Board for the opportunity to meet with you today to review my research study.”

“As you know, schools are faced with many challenges, not only are they responsible for students' learning needs but they also manage complex health issues including asthma, the most common disease of childhood. Asthma is the primary reason cited for school absenteeism. School absenteeism can affect a school’s funding and a child’s academic performance.”

“The purpose of this study is to survey school administrators regarding current asthma management practices within each public school in the Limestone District School Board and Algonquin and Lakeshore Catholic District School Board.”

“I would like to review the study procedure. In a few weeks time, you will receive a study package in the mail. If you are an administrator of more than one school, you will need to complete additional survey for each of the schools under your charge. The study package will contain an information letter (which I will be distributing to you shortly), a demographic questionnaire, an eleven-item self-administered survey and a return postage paid envelope.
Special Instructions

“This survey is not a test with right or wrong answers. As soon as you have answered the survey last question, please be sure that you put it immediately back into the pre-paid return envelope, seal it, and place it in the mail”.

Distribution

A study information letter along with study contact will be provided to each administrator at the meeting.

Retrieval

Administrators will return completed packages in postage paid envelopes provided in the study package. All survey results are confidential. Results will be presented will provide an overview of reported asthma management practices; no individual school or administrator will be identified.

Debriefing

More information about the questionnaire and its purpose may be provided. Appreciation is expressed once again to the participants. Whatever questions people have are answered as fully as possible.

INFORMATION LETTER
A Survey of Current Asthma Management Practices in Kingston Public Schools

Introduction
You are being invited to participate in a research study being conducted by Nicola Thomas of the School of Nursing at Queen’s University. This study is being funded by the generous support of the Ontario Lung Association’s Ontario Respiratory Care Society (ORCS).

It is very important that you read and understand the following information. Please feel free to contact the principal investigator with any questions that will help you understand the study and what you are expected to do.

Purpose
Schools have an increasing role in the promotion and protection children's health. Schools today are faced with many challenges, not only are schools responsible for students' learning needs but they are also managing complex health issues including asthma.

Asthma is the most common reason cited for school absenteeism with highest rates each September. School absenteeism can affect a school’s funding and a child’s academic performance.

Because asthma is so common, and given children spend on average 30 % of their day in school, the school setting is one of the most important venues for asthma prevention, education, and management.
The purpose of this study is to survey school administrators regarding current asthma management practices within each public school in the Limestone District School Board and Algonquin and Lakeshore Catholic District School Board setting.

**Study Procedures**
If you are a school administrator or principal you are eligible to participate, the study involves completion of the survey questionnaire that should take approximately 10-15 minutes to complete. Once the questionnaire is completed, please place it along with the signed consent inside the post-paid envelope provided and mail the package.

The total time involvement is 10-15 minutes.

**Potential Risks**
If you have been involved in an adverse event with a student who has asthma (had to call 911), recalling this event may be emotionally distressing. The Employee Assistance Plan provides services to assist in this regard. As the study involves use of a questionnaire, you may feel pressured or stressed to answer the questions. Please remember this is not a test, there are no right or wrong answers.

**Potential Benefits**
Although you may not have any personal benefit from participation in this study, the results will identify barriers and gaps in current asthma management practices within the school setting. Once the study is completed, you will have an opportunity to participate in a “town hall” to provide opportunity for collaboration, assistance, and support of school staff in the optimal management of childhood asthma. Optimal management school practices have been found to improve a child's academic performance and reduce school absenteeism due to asthma.
**Study Participation**
A decision not to participate in the study will not affect your current role, and responsibilities now or at any time in the future.

**Payment**
You will not be paid to be in the study. You will receive a $5 coffee card as appreciation for your time to participate in the study.

**Confidentiality**
Your information will be kept anonymous and confidential. If the results of this study are presented in a meeting, or published, no one will be able to tell that you were in the study.

Your completed survey and consent will be kept for 7 years in a locked file cabinet and office that is available to researcher and any of the study team. Representatives of the Queen’s University Ethics Board may review your records under the supervision of researcher for audit purposes.

No identifying documentation, samples, or reports resulting from the study, which could be linked directly to you, will leave Queen’s University unless required by law.

**Further Information**
If at any time you have further questions, you may contact

- Nicola Thomas
  Graduate Student and Primary Investigator
  Department of Graduate Studies
  Queen’s University
  (613) 549-6666 ext. 6556
  Fax: 613-548-7803
  thomasn@kgh.kari.net
• Kim Sears, RN, PhD
  Academic Supervisor & Assistant Professor
  Co-Director of Master of Science in Healthcare Quality
  Deputy Director/Patient Safety, Queen's Joanna Briggs Collaboration
  Queen's University
  School of Nursing
  Tel: 613 533-6000, ext. 78763
  Fax: 613 533-6770
  kim.sears@queensu.ca

• Dr. Albert Clark, Chair
  Queen’s University Health Sciences and Affiliated Teaching Hospitals Research Ethics Board
  Queen’s University
  (613) 533-6081
BY Completing this Questionnaire, I am consentIng to participate in this study.

2012 school principal Questionnaire

This questionnaire has been adapted with permission from the Center for Disease Control and Prevention. The purpose of this questionnaire is to assess asthma management programs and policies across within your school board. Your cooperation is essential for making the results of this survey comprehensive, accurate, and timely. Your answers will be kept anonymous and confidential.

Instructions

1. This questionnaire should be completed by the principal (or the person acting in that capacity) and concerns only activities that occur in the school listed below for the grade span listed below. Please ensure you answer all questions.

2. Please use a pencil to fill in the answer circles completely. Do not mark outside the answer circles.

3. Follow the instructions for each question.

4. Write any additional comments you wish to make at the end of the questionnaire.

5. Return the completed questionnaire in the envelope provided.

Person completing this questionnaire

Years in current administrative role: __________

Total years as school administrator: ______

Male ____    Female ____

Age: 25-29 yrs. ____ , 30-39 yrs. ____ , 40-49 yrs. ____ , 50-59 yrs. ____ , 60+ ____

Total Number of Students Enrolled: __________________________

Total Grades in the school: JK-SK ____ , Grades 1-3 ____ , Grades 4-6 ____ , Grades 7-8 ____ , Grades 9-12 ____
1. How many children in your school have asthma? ________

2. At your school, which of the following are used to identify students with asthma?  
   (Mark all that apply.)
   a. Parent note
   b. Form or letter from health care provider (doctor, nurse practitioner, specialist)
   c. Medication form
   d. The school does not have a process to identify students with asthma.
   e. Other (Please elaborate) ________________________________
   f. Do not know

3. An asthma action plan is a written set of instructions completed by the child’s primary care provider (doctor or nurse practitioner) outlining steps for asthma management. At your school, how many students with known asthma have an asthma action plan on file?  
   (Mark one response.)
   a. This school has no students with known asthma.
   b. All students with known asthma have an asthma action plan on file.
   c. Most students with known asthma have an asthma action plan on file.
   d. Some students with known asthma have an asthma action plan on file.
   e. No students with known asthma have an asthma action plan on file.

4. Does your school provide any of the following services for students with asthma?  
   (Mark a check if the box to indicate yes or no for each service. I.e. ☒)
   
<table>
<thead>
<tr>
<th>Service</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Ensuring a written asthma action plan is available on file</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b. Ensuring access to asthma medications, spacers, and peak flow meters at school</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>c. Minimizing asthma triggers (e.g. dust, mould) in the school environment</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>d. Addressing social and emotional issues related to asthma or other special health needs</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>e. Providing additional psychosocial counseling or support services for asthma or other special health needs as required</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>f. Ensuring access to safe, enjoyable physical education and activity opportunities</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>g. Ensuring access to medications before physical activity when needed</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
5. In the past year, did you seek asthma information from any of the following?  
   a. Kingston Lennox and Addington Public Health Unit (KFL&A) ☐ ☐  
   b. Kingston General Hospital’s Asthma Education Centre ☐ ☐  
   c. Ontario Lung Association (OLA) ☐ ☐  
   d. Ontario Physical and Health Education Association (Ophea) ☐ ☐  

6. How often are school staff members required to receive training on recognizing and responding to severe asthma symptoms? (Mark one response.)  
   a. More than once per year  
   b. Once per year  
   c. Every other year  
   d. No such requirement  
   e. Do not know  

7. Does your school have a policy stating that students are permitted to carry and self-administer asthma medications? (Mark one response.)  
   a. Yes  
   b. No  
   c. Do not know  

8. Does your school have procedures to inform each of the following groups about your school's policy permitting students to carry and self-administer asthma medications? (Mark yes or no for each group.)  
   Group  Yes No  
   a. Students ☐ ☐  
   b. Parents and families ☐ ☐  

9. At your school, who is responsible for implementing your school’s policy permitting students to carry and self-administer asthma medications? (Mark one response.)  
   a. No single individual is responsible  
   b. Principal  
   c. Assistant principal  
   d. Individual teacher  
   e. Other school faculty or staff member  
   f. Does not apply
10. What do you see as barriers for implementing effective asthma management policies and procedures?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

11. Additional Comments

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

12. I am interested in participating in a “town hall”* upon study completion.

Yes ☐ No ☐

Thank-you for completing this survey.

*The purpose of the town hall will be to review and discuss study results along with future strategies for optimal asthma management within the school setting.
Appendix H

TOWN HALL INFORMATION AND CONSENT FORM
A Post Survey Town Hall of Reported Current Asthma Management Practices in Kingston Public Schools

Introduction
You are being invited to participate in a town hall as part of the research study being conducted by Nicola Thomas of the School of Nursing at Queen's University. This study is being funded by the generous support of the Ontario Lung Association's Ontario Respiratory Care Society (ORCS).

It is very important that you read and understand the following information. Please feel free to contact the principal investigator with any questions that will help you understand the study and what you are expected to do.

Purpose
The purpose of this town hall is to:

• Review collective survey results of current asthma management practices within public schools in the Limestone District School Board and Algonquin and Lakeshore Catholic District School Board setting;
• Identify strengths and barriers to asthma management within the school setting;
• Better understand administrators’ experiences with asthma management;
• Discuss next steps for asthma management within the Limestone District School Board and Algonquin and Lakeshore Catholic District School Board setting.
**Study Procedures**
If you are a school administrator or principal you are eligible to participate, the town hall will be audio taped. Nicola Thomas will present survey results and then facilitate the discussions.

**The total time involvement is 60-90 minutes.**

**Potential Risks**
By signing this consent form, you do not waive your legal rights or release the primary investigator from their legal and professional responsibilities.

**Potential Benefits**
You will not have any personal benefit from participation in this study; however, results will provided better understanding of strengths and gaps to asthma management in the public school setting and give a voice to the experiences reported by administrators. In addition, the town hall will provide opportunity for collaboration, assistance, and support of school staff to provide a safe and supportive environment; improving academic performance and reduce school absenteeism for children with asthma.

**Confidentiality**
Your information will be kept confidential. Your name will not be used at all in the study records. If the results of this study are presented in a meeting, or published, no one will be able to tell that you were in the study.

Transcription of town hall and your consent will be kept for 7 years in a locked file cabinet and office that is available to researcher and any of the study team. Representatives of the Queen’s University Ethics Board may review your records under the supervision of researcher for audit purposes.
No identifying documentation, samples, or reports resulting from the study, which could be linked directly to you, will leave Queen’s, University unless required by law.

**Further Information**
If at any time you have further questions, you may contact

- Nicola Thomas  
  Graduate Student and Primary Investigator  
  Department of Graduate Studies  
  Queen’s University  
  (613) 549-6666 ext. 6556  
  Fax: 613-548-7803  
  thomasn@kgih.kari.net

- Kim Sears, RN, PhD  
  Academic Supervisor & Assistant Professor  
  Co-Director of Master of Science in Healthcare Quality  
  Deputy Director/Patient Safety, Queen's Joanna Briggs  
  Collaboration  
  Queen's University  
  School of Nursing  
  Tel: 613 533-6000, ext. 78763  
  Fax: 613 533-6770  
  kim.sears@queensu.ca

- Dr. Albert Clark, Chair  
  Queen’s University Health Sciences Affiliated Teaching Hospitals  
  Research Ethics Board  
  (613) 533-6081
Subject Statement and Signature Section

I have read and understand the consent form for this town hall study. I have been given sufficient time to consider the above information. I am voluntarily signing this form. I will receive a copy of this consent form for my information.

By signing this consent form, I am indicating that I

______________________________ agree to participate in this town hall study.
(Printed name)

______________________________ Date
Signature Date

______________________________ Date
Signature of Witness Date

Statement of the Investigator

I, or one of my colleagues, have carefully explained the information within this consent form to the participant, and certify that, to the best of my knowledge, the participant understands clearly the nature of the study.

______________________________ Date
Signature of Investigator Date
Appendix I

Anaphylaxis Emergency Plan:

This person has a potentially life-threatening allergy (anaphylaxis) to:

(Check the appropriate boxes.)

- Peanut
- Tree nuts
- Other: __________________________
- Egg
- Latex
- Milk
- Medication: ________________________

Food: The key to preventing an anaphylactic emergency is absolute avoidance of the allergen. People with food allergies should not share food or eat unmarked / bulk foods or products with a “may contain” warning.

Epinephrine Auto-Injector: Expiry Date: ______________________ / __________________

Dosage:

- EpiPen® Jr 0.15 mg
- EpiPen® 0.30 mg
- Twinject® 0.15 mg
- Twinject® 0.30 mg

Location of Auto-Injector(s): ________________________________

- Previous anaphylactic reaction: Person is at greater risk.
- Asthmatic: Person is at greater risk. If person is having a reaction and has difficulty breathing, give epinephrine auto-injector before asthma medication.

A person having an anaphylactic reaction might have ANY of these signs and symptoms:

- Skin system: hives, swelling, itching, warmth, redness, rash
- Respiratory system (breathing): coughing, wheezing, shortness of breath, chest pain/tightness, hoarse voice, nasal congestion or hay fever-like symptoms (runny, itchy nose and watery eyes, sneezing), trouble swallowing
- Gastrointestinal system (stomach): nausea, pain/cramps, vomiting, diarrhea
- Cardiovascular system (heart): pale/blue colour, weak pulse, passing out, dizzy/lightheaded, shock
- Other: anxiety, feeling of “impending doom”, headache, uterine cramps, metallic taste

Early recognition of symptoms and immediate treatment could save a person’s life.

Act quickly. The first signs of a reaction can be mild, but symptoms can get worse very quickly.

1. Give epinephrine auto-injector (e.g. EpiPen® or Twinject®) at the first sign of a known or suspected anaphylactic reaction. (See attached instruction sheet.)
2. Call 9-1-1 or local emergency medical services. Tell them someone is having a life-threatening allergic reaction.
3. Give a second dose of epinephrine in 5 to 15 minutes IF the reaction continues or worsens.
4. Go to the nearest hospital immediately (ideally by ambulance), even if symptoms are mild or have stopped. The reaction could worsen or come back, even after proper treatment. Stay in the hospital for an appropriate period of observation as decided by the emergency department physician (generally about 4 hours).
5. Call emergency contact person (e.g. parent, guardian).

Emergency Contact Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Relationship</th>
<th>Home Phone</th>
<th>Work Phone</th>
<th>Cell Phone</th>
</tr>
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</table>

The undersigned patient, parent, or guardian authorizes any adult to administer epinephrine to the above-named person in the event of an anaphylactic reaction, as described above. This protocol has been recommended by the patient's physician.

Patient/Parent/Guardian Signature          Date          Physician Signature □ On file          Date
World Asthma Day – May 7, 2013

1. PRESS CONFERENCE

Place: Media Studio, Queen’s Park Legislative Building

Time: 9:30 a.m.

Panel: Dr. Sharon Dell, Toronto Hospital for Sick Children
      Mr. Chris Markham, Ophea
      Mr. George Habib, Ontario Lung Association
      Ms. Sandra Gibbons

Theme: Creating Asthma Friendly Environments in Schools

Talking Points: One in five children in Ontario schools has asthma.

Asthma is a dangerous and potentially fatal lung disease that kills hundreds of Canadians every year, including children.

Ryan Gibbons, 12-year-old son of Sandra Gibbons, died at school after an asthma attack.

Ontario has no province-wide policy to ensure that school is a safe and welcoming environment for children living with asthma.

Principals and staff should be aware of actions they can take to make their schools asthma-friendly environments.

School boards should adopt policies designed to make their schools asthma friendly.
Ophea and OLA have developed a seven-step process to help schools become asthma friendly.

2. MEDIA RELEASE

Title: TBD

Theme: Call to action: Need to create asthma friendly environments in schools

Distribution: Newsire; email; OLA community offices; matte article through OCNA

3. SCHOOLS MAILOUT

Medium: Polybag “outsert” with May issue of CAP Journal, magazine distributed to school principals.

Circulation: ~1,000 in Ontario

Contents: Joint letter from OLA-Ophea
Booklet: 7 Steps to Make Your School Asthma Friendly
Ophea booklet: Asthma in Schools – What Educators Need to Know
OLA form: Student Asthma Management Plan

3. VIDEO

Title: Ryan’s Story

Content: Sandra Gibbons talks about her 12-year-old son, Ryan, who died at school last October following an asthma attack.

Distribution: b-roll with World Asthma Day press release
30-second broadcast PSA
3-4 minute Youtube video
World Asthma Day – May 7, 2013

Dear Principal,

One in five students in Ontario schools has asthma. On the occasion of World Asthma Day 2013, the Ontario Lung Association and Ophea are working together to ensure that all schools in Ontario are asthma-friendly environments.

With your current issue of CAP Journal, we are sending you Ophea and Ontario Lung Association resources designed to help you make your school a safe and welcoming environment for students and staff with asthma. We hope that you find these materials useful and that you will share them with your staff.

This fall, Ophea will also be sending the Managing Asthma In Our Schools DVD Resource Package to all 5,000 English and French schools in Ontario. The DVD provides educators with knowledge to support students in managing their asthma independently, and by enhancing educators’ understanding and confidence in responding to asthma-related situations.

In addition, the Ontario Lung Association has Certified Respiratory Educators on staff, available to provide advice, training and resources for your staff. Call us at 1-888-344-LUNG (5864) or go to www.on.lung.ca or www.ophea.net to order free asthma resources – including more copies of the enclosed Student Asthma Management Plan and the booklet Asthma in Schools: What Educators Need to Know.

Sincerely,

George Habib
President and C.E.O.
Ontario Lung Association

Chris Markham
Executive Director and C.E.O.
Ophea

When you can't breathe, nothing else matters."
1 IN 5 STUDENTS IN ONTARIO SCHOOLS HAS ASTHMA. MAKE YOUR SCHOOL A PLACE WHERE THEY CAN BREATHE FREELY.
Appendix M

STUDENT ASTHMA MANAGEMENT PLAN

(To be completed by parent/guardian)

STUDENT ___________________________  AGE ___________________________
TEACHER ___________________________  GRADE ___________________________

EMERGENCY CONTACT INFORMATION

<table>
<thead>
<tr>
<th>Name</th>
<th>Relationship</th>
<th>Daytime Phone</th>
<th>Alternate Phone</th>
</tr>
</thead>
</table>

KNOWN ASTHMA TRIGGERS
☐ colds/viruses  ☐ physical activity  ☐ hot/cold weather  ☐ strong smells  ☐ pets  ☐ allergies (specify)
☐ anaphylaxis (people with asthma can have life-threatening breathing problems during an anaphylactic reaction)  ☐ other (specify): ________________

RELIEVER INHALER (FAST-ACTING, USUALLY BLUE):

Use reliever inhaler (name of medicine) ________________ in the dose of ________________ number of puffs or nebulizer dose.

Maximum number of times the student can use the reliever inhaler per day is ________________.

Reliever inhaler is used to (check all boxes that apply):
☐ Relieve symptoms (see "MANAGING ASTHMA EPISODES" below)
☐ Prevent exercise/activity-induced asthma (given 10-15 minutes before activity)
☐ Other (specify): ________________

Location of reliever:  ☐ Stored in (specify location): ________________  ☐ Student carries own inhaler

Can student self-administer?  ☐ No, needs assistance  ☐ Yes  ☐ spacer provided?  ☐ Yes  ☐ No

MANAGING ASTHMA EPISODES

**MILD ASTHMA EPISODE**

If ANY of the following symptoms occur:
- Continuous coughing
- Difficulty breathing
- Chest tightness
- Wheezing (whistling in chest)

Student may also be restless, irritable and/or tired.

Step 1: Immediately use fast-acting reliever inhaler (usually a blue inhaler).

Check symptoms. Cpery return to normal activity when all symptoms are gone.

Step 2: If symptoms get worse or do not improve within 10 minutes, this is an emergency—follow steps below.

**ASTHMA EMERGENCY**

If ANY of the following occur:
- Breathing is difficult and fast
- Cannot speak more than 5 words between breaths
- Lips or nail beds are blue or gray
- Skin on neck or chest sucked in with each breath

Student may also be anxious, confused and/or very tired.

Step 1: CALL 911 for an ambulance.

Step 2: Immediately use fast-acting reliever inhaler (usually a blue inhaler).

If symptoms continue, use reliever inhaler every 5-15 minutes until medical help arrives.

While waiting for medical help to arrive:
- Have student sit up with arms resting on a table (do not have student lie down unless it is a life-threatening allergic event)
- Stay calm, reassure the student and stay by their side
- Notify parent/guardian or emergency contact

Asthma Action Helpline: 1-888-344-5984  Public Health School Asthma Project

THE LUNG ASSOCIATION®

Ontario
Managing Asthma Attacks

**Milder Symptoms**

If any of the following symptoms occur:
- Constant coughing
- Trouble breathing
- Chest tightness
  (like a tight band around chest)
- Wheezing (whistling sound in chest)

**Step 1:**
Immediately use fast-acting reliever inhaler (usually blue).
Check symptoms. Only return to normal activity when all symptoms are gone.

**Step 2:**
If symptoms get worse or do not improve within 10 minutes, this is an emergency - immediately follow these steps.

**Asthma Emergency**

If any of the following symptoms occur:
- Breathing is difficult and fast
- Difficulty speaking
- Lips or nail beds are blue or gray
- Skin on neck or chest sucked in with each breath
- Person may also be anxious, confused or tired.

**Step 1:**
Call 911 for an ambulance
Wait for ambulance - Do not drive person to hospital

**Step 2:**
Immediately use fast-acting reliever inhaler (usually blue).
Continue to use reliever inhaler every 5-15 minutes until medical help arrives.

While waiting for medical help to arrive:
- Have person sit up with arms resting on a table (do not have person lie down unless it is a life threatening allergic event)
- Stay calm, reassure and stay with the person
- Notify parent/guardian or emergency contact

To learn about asthma call The Lung Association’s Lung Health Information Line at 1-888-344-LUNG (5864) or visit www.on.lung.ca